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For Men Who Manage

food processing

JUNE 1957

Putman Publishing Company
EXECUTIVE MAGAZINES FOR INDUSTRY

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Corn Products scientists slash moisture-testing time 95% with new practical method 32

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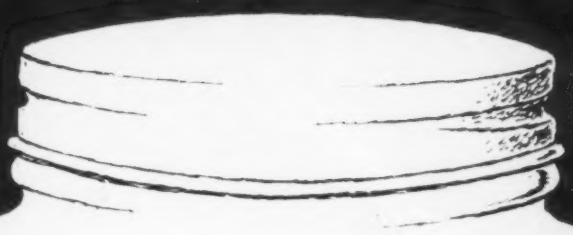
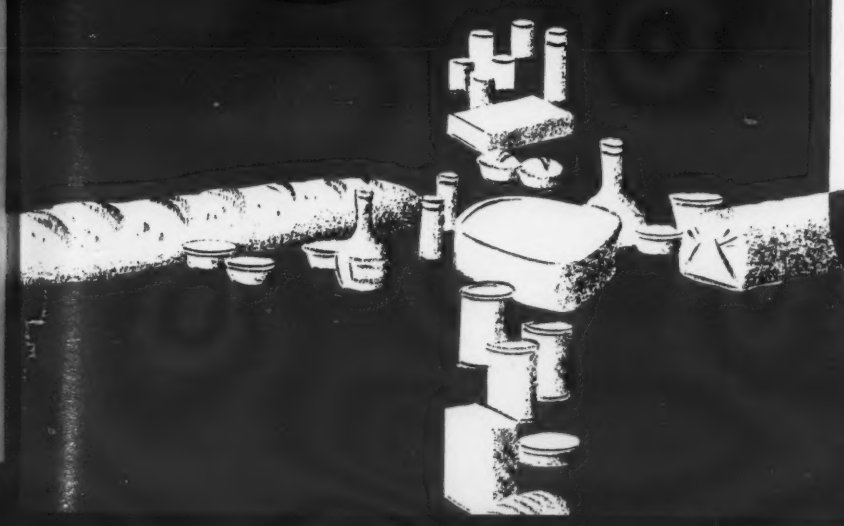


Author of Hale Amendment, Michael Markel, proposes simplification of food standards—see page 21—to

UNSHACKLE

THE IMPROVEMENT OF FOOD PRODUCTS



FOAMGLAS®

the cellular, stay-dry insulation

Huge fermenting tank moves through open wall area of Stroh stockhouse. Note strong, moisture-proof FOAMGLAS in place in some wall areas . . . where it stood exposed to the weather for weeks. Engineers: Harley, Ellington & Day, Inc., Detroit.
Insulation Contractor: Sprinkmann Sons Construction Co., Detroit

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Workman is shown installing 6" multilayer FOAMGLAS wall insulation within Stroh stockhouse framing. 8" layer of insulation was applied on roof, 4" on basement floor and 3" on intermediate floors. Stroh also relies on moisture-proof FOAMGLAS for lasting insulating value in such other tough brewery uses as CO_2 storage areas, government cellar, low temperature piping, etc.

Also manufacturers of PC Glass Blocks

When inquiring check 8174 opposite last page

that's interesting

Postal progress

The Post Office Department has purchased, through the Chevrolet Division of General Motors, 1045 specially designed forward control trucks.

Bodies are built by Herman Body Co., St., Louis, Mo. Two standard body sizes are used and mount on short wheelbase Chevrolet chassis. Both have 4-section, snug-fitting roll-up rear doors. Trucks are equipped with automatic transmission for right-hand, sit, or stand-drive operation.

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A refrigerated window for frozen foods is being designed.

(Windo Matic® is a development of WindoMatic® Service, Dept. FP, 10 Park Ave., New York 16, N. Y.

Budget quiz

1) How much is the Government's proposed budget for 1958? 2) Has the Government ever spent more in a single year? 3) What will the 1958 budget mean to families and the individual? 4) How high is the national debt now? (Answers on inside back cover)

through

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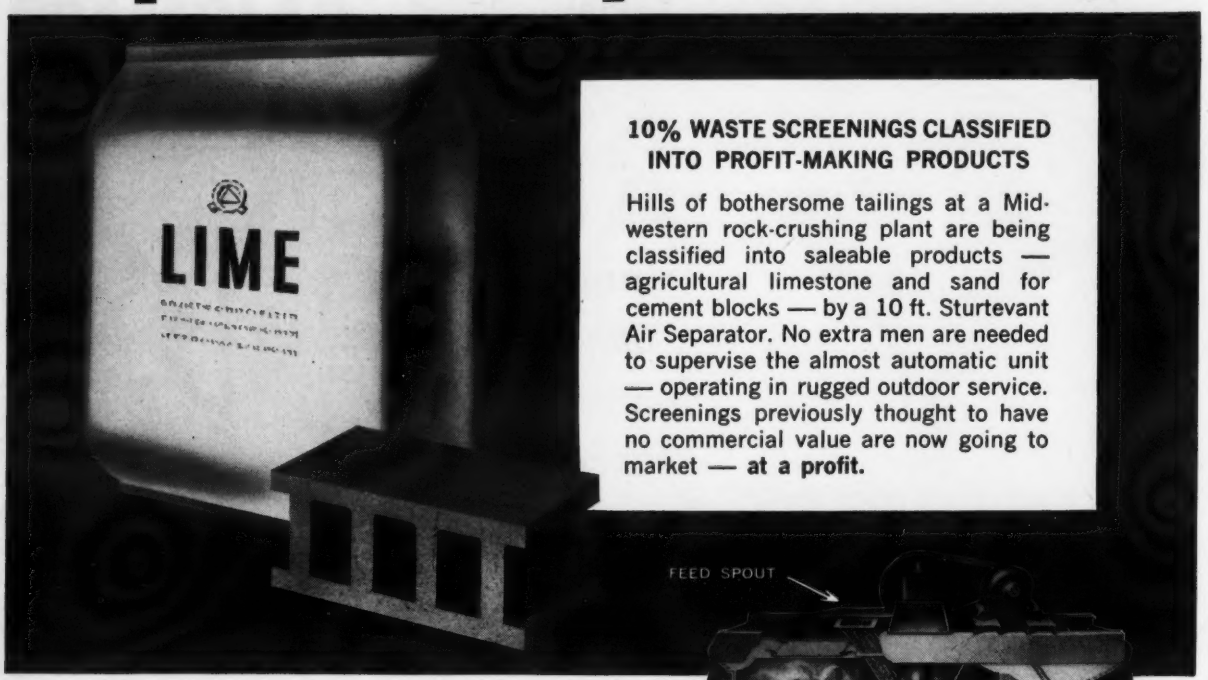
Tailings Go to Market - Separated by Sturtevant



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food processing

(FOOD PROCESSING PREVIEW)

For Men Who Manage
Published in Chicago
Food Capital of the World

VOL. 18 NO. 6 JUNE 1957

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"Captive" readers?

"Mr. Putman wants you in his office for a staff meeting." Somewhat ominous words for a neophyte FOOD PROCESSING editor of one week's experience.

Having just completed 6 years as an editor at the Quartermaster Food and Container Institute, I knew something about conferences called by commanding officers and laboratory chiefs. But what does a publisher say in such a situation?

Mr. Putman pointed out that one philosophy of business publishing seems to regard the reader as part of a "captive audience." He reminded us that no one in the food industry must read a publication simply "because it's good for him."

"Certainly," he emphasized, "food processors want news that's important to them, but they want it easily identified as important, attractively presented and to-the-point." As he put it, "Until an article is read it serves no one. Putman policy is based on respect for the reader."

A week later in Pittsburgh, at the May annual meeting of the Institute of Food Technologists, I heard first-hand appraisals of the result of this editorial policy. At least a dozen busy men in food research, new product development, technical service, quality control, market analysis and sales, volunteered favorable comments on contents, degree of coverage and readability. While as yet I can't take any personal credit, I found myself very proud to be part of the Putman organization.

I'm sincerely happy to have been able to meet some of you personally at the IFT meeting. I hope these personal contacts occur more often.

Jack Lenier

ASSISTANT EDITOR

food processing **highlights**

June 1957 volume 20 number 6

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THIS MONTH'S COVER

The cover artist decided to crop away all of the photo of Michael Markel but his face. While this was essential to the design of this month's cover, it meant that the unusual desk at which Markel was seated when the picture was taken would not show. The desk is hexagonal in shape and has working accommodations for six people. Part of this desk is visible in illustration on page 22.

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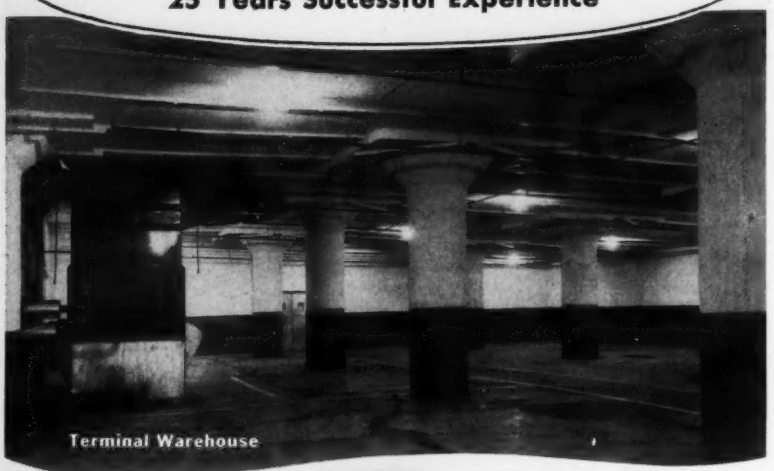
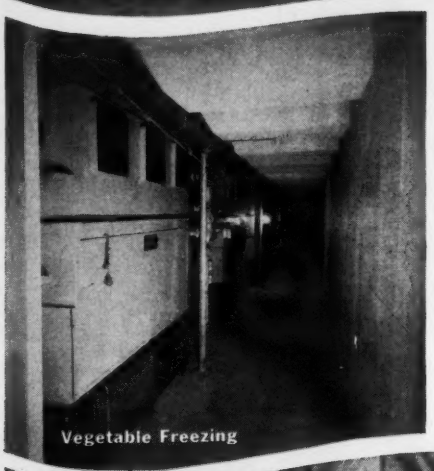


Terminal Warehouse



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food regulations

Processors could capitalize on congressional investigations

Food costs, poultry problems, 'monopoly' practices

Processor executives and other food industry leaders are again the objects of investigation on Capitol Hill, with no less than four committees looking into various aspects of production and marketing problems. There is little chance that the probes will result in new legislation this year.

The lawmakers, meantime, are getting several million words "on the record" which may serve as handy campaign material in the congressional elections next year. A feature attraction is the investigation of the House Agriculture committee's Consumers Study subcommittee, headed by Rep. Victor Anfuso (*D., N. Y.*)

His committee's purpose, says the Congressman from Brooklyn, will be to "do everything possible to reduce the cost of food to consumers."

"That includes," he adds, "the study of processing costs, along with use of trading stamps, food industry profits, and marketing practices such as the integration of production, processing, and distribution activities."

Of the $1,500 spent by the average city family for food in 1956, a preliminary report of Anfuso's committee points out, $930 "went to the agencies which processed, transported, and distributed the foods to the retail purchasers".

Why farmers receive only 9% of food sales

Between 1947 and 1956, the report emphasizes, food expenditures of the average city family went up by $500 of which "80 percent found its way into the marketing margin and only 9 percent went to the farmers."

The committee then makes two comments on the figures: *First,* that the increase is partly due to family purchases of more foods such as meats, poultry, and eggs, and fewer cereal products, potatoes, and the like.

Second, and even more important, the rapidly mounting purchases of more ready-prepared, fresh frozen, and specially packaged foods. "The increased payments to marketing agencies," the committee comments, "represent payments for additional services as well as higher costs . . ."

Testimony of witnesses before the Anfuso committee has thus far added up to a net plus for processors and the food industry generally, in the judgment of qualified Washington observers.

Agriculture Secretary Benson, for instance, said in effect that the reason for rising food prices is due to rising marketing costs.

Investigation of food cost trends, if carried out fairly, will point up the absurdity of controls over the food industry, either by government "or so-called self-help industry monopolies like marketing agreements," says Mr. Carolos Campbell, executive secretary of the National Canners Association.

Marketing costs

Marketing cost during the base period of 1947-49 was $61.72 for the fresh fruit and

vegetable component of the market basket, says Mr. Campbell. For 1956, he points out, it cost $79.73 to market the same volume of the same commodities, an increase of $18.01. But during the same period the marketing costs of canned fruits and vegetables "remained constant, in fact declined slightly."

Other factors may be involved, Mr. Campbell adds, but "the fact does remain . . . that marketing orders are widely used for fresh fruits and vegetables, and not in canning."

Still another group taking a look at processor activities is a special subcommittee on food industries of the House Small Business committee. Subcommittee Chairman is Rep. Charles H. Brown (*D., Mo.*) who says congress has had complaints that alleged "predatory credit practices" of big packers and feed companies in the poultry industry are hurting the small processor, feed dealer, hatcherymen, and producers. Subcommittee hearings started in mid-May.

"We want this study to be complete, factual and comprehensive," says the young Congressman from Missouri. "We are not looking for villains or bogey-men. We are earnestly seeking the cause of the discouraging amount of 'red ink' in the various phases of the poultry industry."

Should poultrymen have special laws?

Meantime, as reported here last month, the Senate Agriculture committee is also looking into poultry problems. Committee chairman is Sen. Allen J. Ellender (*D., La.*), The committee has taken on a professional investigator to devote full-time to the Senate study. He is Mr. Ed Guinane, formerly with the FBI.

"We are writing the agricultural commissioners of 22 leading broiler states for their ideas, because we first want to find out just what the problem is," say Guinane. "After that we will see what can be done."

Committee staff people plan to visit major broiler produc-

(*Turn to next page*)

Fairbanks-Morse fire pumps provide 12,000 gpm. of water at 100 psi. for each of two systems.

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(Continued from preceding page)

ing areas, but have not scheduled hearings to date, either in Washington or elsewhere.

Another group airing trade practices is the Senate Judiciary Committee's Anti-Trust & Monopoly subcommittee, headed by Sen. Joseph O'Mahoney (*D., Wy.*). Specifically, this group is considering legislation that would transfer to the Federal Trade Commission enforcement authority of monopoly and trade provisions of the Packers & Stockyards act. These provisions, contained in Title II of the act, are now enforced by the Agriculture Department.

Charges have been made, however, that Department supervision of packers has been lax, and that this results in discrimination against other segments of the food industry which fall under jurisdiction of the FTC.

Decides chain is also packer

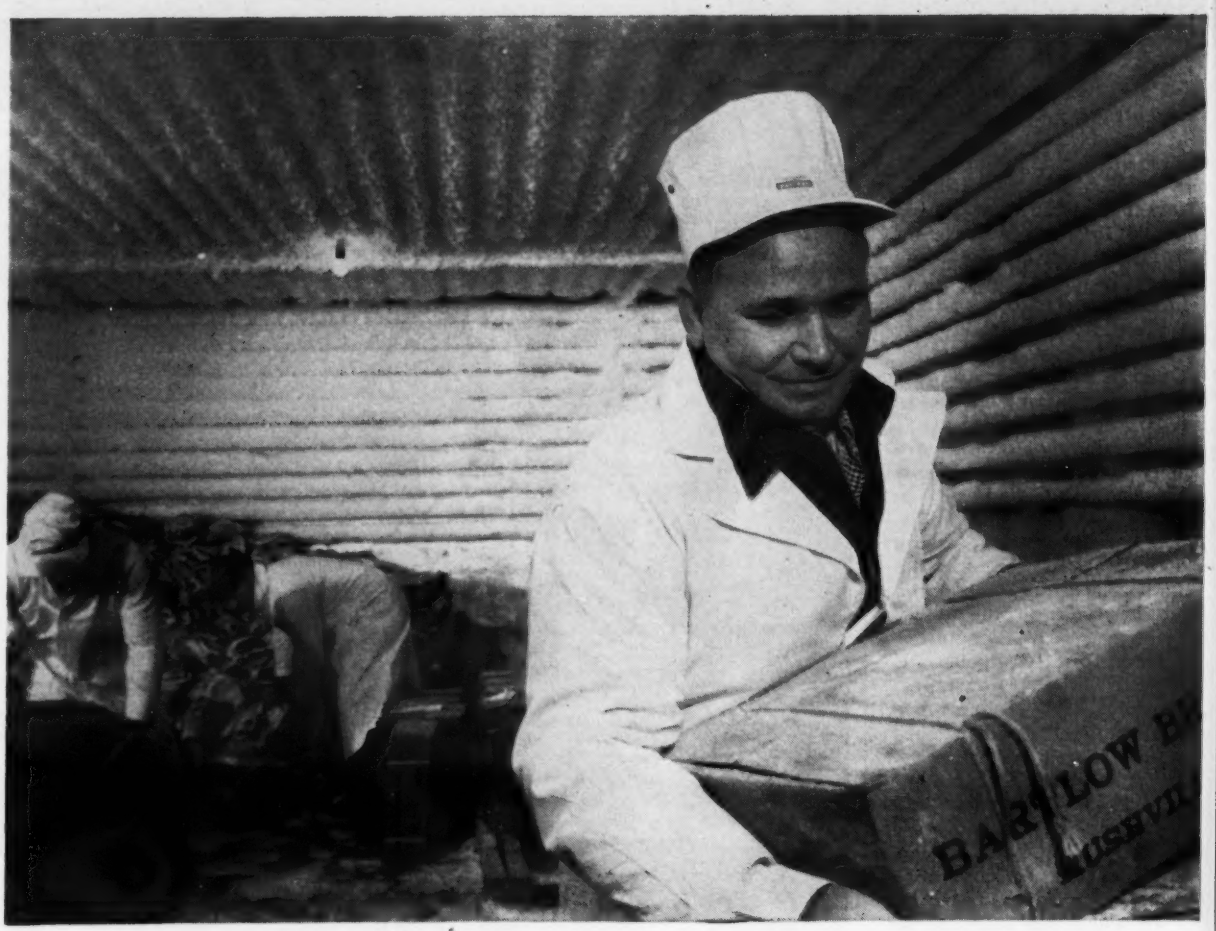
Complicating the situation is the recent preliminary decision of an FTC hearing examiner that the retail chain of Food Fair Stores, Philadelphia, qualifies under the law as a packer. Food Fair owns a packing plant at Elizabeth, N. J. As a "packer" the food chain would be subject to regulation by the USDA rather than FTC.

Secretary Benson has reported that 14 food chains, including the six largest, are now filing reports with his department under the packers' act. All would be automatically exempt from FTC jurisdiction if the preliminary decision stands up.

Involved in the FTC-USDA jurisdictional dispute, as in the congressional investigations, is the question of whether integration of production, processing, and distribution activities is an economic blessing or a curse.

Vertical integration will continue

Some lawmakers say they suspect "vertical integration" is harming consumers as well as farmers. Congress can talk itself blue, but integration will keep spreading, in the view



After eleven years' use, Illinois meat packer testifies to permanent efficiency of Styrofoam® insulation

Bartlow Brothers, an Illinois meat packing firm, has used 100,000 board feet of Styrofoam (a Dow plastic foam). In 1946 approximately 80,000 board feet were installed. In 1955, another 20,000 feet were specified for a new addition! They have used it in ceilings, walls and floors in several storage rooms, including the utility freezer shown above.

After eleven years' experience, Bartlow prefers Styrofoam because of its lifetime low "K" factor and its unyielding resistance to water and moisture. As for its over-all insulating efficiency, one Bartlow spokesman put it this way: ". . . we have noted that over a week end, when the doors are not being constantly opened . . . our smallest machine, a 6′ x 6′ Frick, will keep the entire building at temperature."

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THE DOW CHEMICAL COMPANY
Midland, Michigan

of Agriculture Department officials.

"No longer is the raising of poultry a sideline which enables the farm housewife to earn a little grocery money," says USDA Assistant Secretary Earl Butz. "It is now big business." The large-scale and efficient organization of production, processing, and distribution have made this striking change possible.

"In the efficiency race, the white meat industry has put on a show that would make some other industries green with envy . . . The shift has been to large commercial units raising, say 150,000 birds per man per year, and killing, dressing, and processing 2 million birds per plant . . .

Integration affects all foods

"Similar examples of integration may be found in some of our canning and freezing vegetable crops, where the production of a quality product under modern scientific methods almost dictates an integrated production and processing arrangement all the way from field to warehouse.

"Large animal production in this country is by no means immune from the possibility of integration. It may not happen in the same way or to the same extent as occurred in the poultry industry. But the pressure is in that direction."

Brief but Important

Chemical additive legislation, proposed by Food & Drug Administration, has now been introduced in the Senate. The bill is S 1895, tossed in the hopper by Senator Lister Hill (*D., Ala.*) and Senator H. Alexander Smith (*R., N.J.*). Identical legislation, HR 6747, was introduced earlier in the House by Rep. Oren Harris, (*D., Ark.*). A bill supported by the food and chemical industries, HR 366, has been introduced in the House by Rep. Joseph O'Hara (*R., Minn.*). Identical House bills, HR 4101 and HR 4432, also have been introduced respectively by Reps. John Delaney (*D., N.Y.*) and Leonor K. Sullivan (*D., Mo.*).

(*Turn to next page*)

SHEFTENE

BALANCED MILK PROTEINS

COMPLETE NUTRITIONAL SUPPLEMENTS . . .

RICH IN LYSINE

WITH ALL 8 ESSENTIAL AMINO ACIDS IN PROPER BALANCE

SHEFTENE Milk Proteins added to *your* food products give that extra plus in nutritive value.

The fact that the SHEFTENES provide *all 8 essential amino acids in proper balance* . . . with an abundance of Lysine . . . assures you of the best in quality of protein that can be built into your bakery products, flour, cereals, infant and geriatric foods.

SHEFTENE Milk Proteins are wholesome, edible products of high-quality, balanced protein content, capable of supporting growth and maintaining nitrogen equilibrium.

With 60 years of leadership in natural milk derivatives . . . including 30 years as leading producers of milk proteins . . . SHEFFIELD CHEMICAL is recognized as MILK PROTEIN HEADQUARTERS, your greatest and most reliable source of milk proteins in America today.

THE SHEFTENE SERIES

SHEFTENE C2 Edible Casein Flour (soluble form), and SHEFTENE C2 Edible Casein . . . to improve nutritive value of bakery products, flour, cereals.

SHEFTENE Calcium Caseinate . . . for supplementation of bakery products, flour, cereals; pharmaceutical, infant food and dietetic preparations.

SHEFTENE 60 . . . an excellent oral supplement for dietary foods and geriatric diet preparations.

THESE SHEFTENE PRODUCTS ARE AVAILABLE IN QUANTITIES TO MEET YOUR REQUIREMENTS

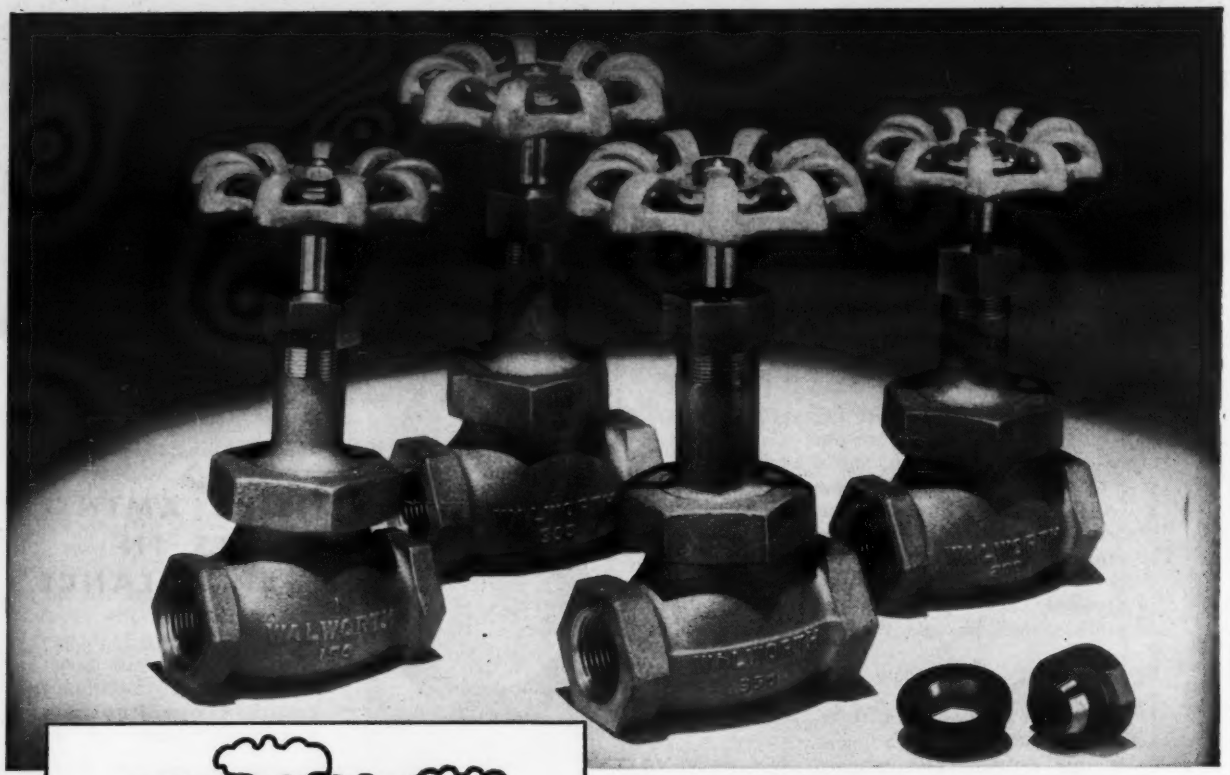
We welcome every opportunity to show you how SHEFTENE Milk Proteins can increase the nutritive value of your products. Write or phone our Technical Sales Dept.

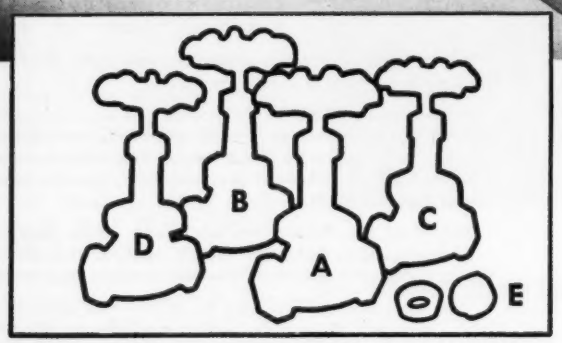
ASK FOR FREE SAMPLES AND TECHNICAL DATA

SHEFFIELD CHEMICAL
Norwich, N. Y.

A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION

When inquiring check 8182 opposite last page





A — No. 225P.....350 WSP 550F, 1000 WOG
B — No. 260P.....300 WSP 550F, 600 WOG
C — No. 245P.....200 WSP 550F, 400 WOG
D — No. 237P.....150 WSP 500F, 300 WOG
E — "500 Brinell" Stainless Steel Plug Type Seat and Disc

Walworth offers four lines of Bronze Globe Valves with stainless steel, plug-type seats and discs. Advantages of these valves include:

• **Stainless Steel Plug-Type Seats and Discs,** heat-treated to a minimum of 500 Brinell hardness reduces wire-drawing to a minimum. Seats and Discs are machined and fitted simultaneously, assuring perfect mating.

• **Deep Stuffing Boxes with Glands** are fitted with reinforced, molded packing. Valves can be repacked under pressure when fully opened.

For Longer Bronze Valve Life . . .

"500 BRINELL" PLUG-TYPE STAINLESS STEEL SEATS AND DISCS

150 lb. 200 lb. 300 lb. 350 lb.

• **Oversize Stems,** made of high tensile strength silicon-bronze, assure long life.

• **Rugged Body Hexes,** are flat on top; do not interfere with wrench gripping body-to-bonnet union ring connection.

• **Bodies,** made of Composition M bronze (ASTM B61), have ample wall thickness to provide high safety factor.

• **Patented Handwheels** are air-cooled and designed with a "finger-fit grip." Makes turning easy even when wearing greasy gloves.

• **Identification Plates** secured by lock-washer under stem nut, show Figure Number of valves and make re-ordering sure and easy.

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SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. CONOFLOW CORPORATION M & H VALVE & FITTINGS CO. SOUTHWEST FABRICATING & WELDING CO., INC. WALWORTH COMPANY OF CANADA, LTD.

When inquiring check 8183 opposite last page

food regulations

(Continued from preceding page)

"Defense Guides for Commercial Food Facilities" is the title of a new booklet being distributed to the food industry by the USDA. The publication, say officials, contains "practical suggestions for assuring continued operation of commercial food facilities in the event of enemy attack." A free copy of the guide may be obtained by writing the Commodity Stabilization Service, USDA, Washington 25, D. C.

A continuous process for producing a peach puree concentrate and a frozen peach nectar concentrate has been developed by USDA, officials report. In the process, say researchers, "the volatile flavors that normally would be lost in processing the fruit are recovered, and the products have excellent natural fruit flavor." The method is not yet being used commercially, but ice cream manufacturers are reported to be interested.

Donations of surplus foods by the USDA continue to go up, sharply. The increase has been 54% in the first nine months of this fiscal year compared with last year.

FDA STANDARDS

List of foods for which standards have been established is available from Food and Drug Administration, Washington 25, D. C.

Color certification: Order to eliminate use on food of Yellows No. 1, 2, 3, and 4 becomes effective 90 days after publication in the Federal Register dated May 4, 1957. Objections were to be filed within 30 days of the same date. After due consideration, said officals, the coal-tar colors were found to be "not harmless . . . in coloring food."

Tuna fish: Time has been extended, until Aug. 13, before fill-of-container standards will take effect for this product.

Citrus fruit: Still pending, and some time away, is a decision on the petition by Crown Zellerbach Corp., San Francisco, requesting that the pesticide chemical diphenyl be exempted from a tolerance

requirement when applied after harvest on grapefruit, lemons, and oranges. Following a review of the question, the government recently announced it had decided to maintain a tolerance of 110 parts per million of residues of diphenyl on citrus fruits in question. Hearings may be held on the petition.

Canned fruits: A petition has been filed by the National Canners Association requesting changes in standards for certain canned fruits to provide for use of artificial sweeteners. Amended standards to permit such use have been asked for canned apricots, cherries, figs, fruit cocktail, peaches, and pears. Officials have the petition under study.

Copra: An order has been issued and is now in effect establishing a tolerance of 50 parts per million for residues of ethylene oxide in or on this product. Any person adversely affected had until the first of this month to file objections.

Canned prune juice: Hearings now have been concluded to decide whether honey shall be allowed as an optional ingredient in this product. Briefs based on evidence brought out in the hearing are to be filed by June 26. Some time after that date the government will issue a tentative order on this matter.

USDA STANDARDS

Checklist of new or proposed grade standards issued by USDA follows. Except where noted, complete texts can be secured from USDA, Fruit and Vegetable Branch, Processed Division, Washington 25, D. C.

Frozen peas: Proposed revisions call for changes, say officials, which are "slightly more restrictive". They include (1) requirement that the product have color in relation to maturity; (2) a partial limiting rule in grade C for color; (3) scoring of spotted or off-color peas for color as well as defects; (4) a full limiting rule for defects; (5) more detailed objective tolerances in regard to defects.

Present grade designations are not changed in the proposed revisions. Interested persons have until December 1, to take exceptions to the proposals.

(*Turn to next page*)

No Spoilage Bacteria
IN THIS SHIPMENT
it's filtered with
CELITE
Whether you are refining sugar or buying it for use in your process operations, you can be sure that liquid sugar is free of thermophilic bacteria when it is filtered with Celite*. Efficient, economical Celite filtration delivers brilliantly clear liquid sugar that will remain positively pure as long as it is protected from recontamination by spores in the surrounding air.
Celite is also ideal for filtering other food products such as syrups, jellies, beer and wine. Composed of microscopic particles of pure inert diatomaceous silica, Celite provides fast, economical clarification . . . never affects the most delicate flavors.
And with Celite you get important advantages over other diatomites. Its lower wet density means greater filter surface coverage. Its high uniformity means more consistent results. For more information on how Celite filtration helps the food industry make better products at lower cost, call your near-by Celite engineer or write Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.
*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.
Johns-Manville CELITE
diatomite filter aids
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PRODUCTS
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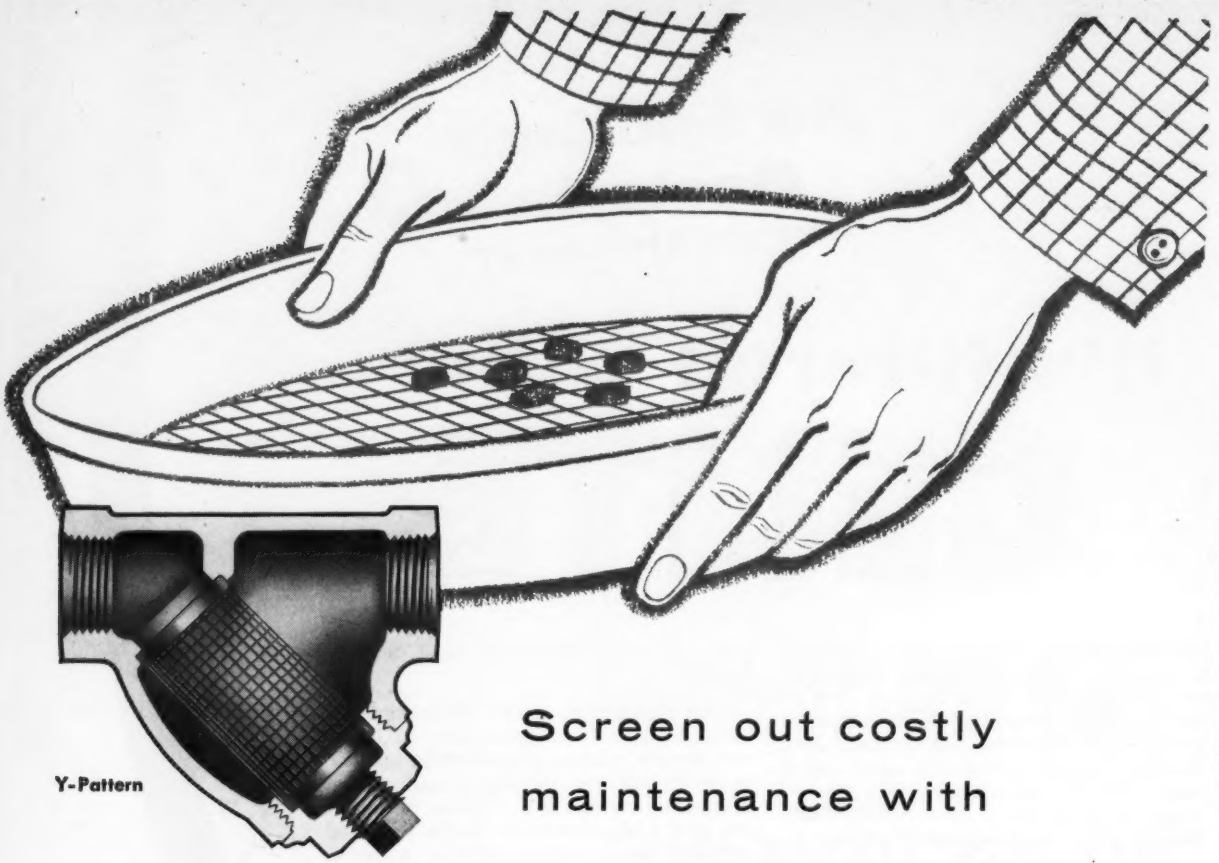


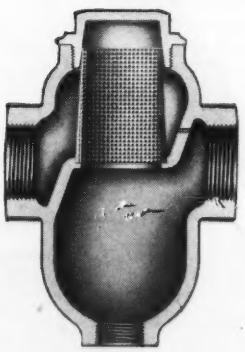
Y-Pattern

Screen out costly maintenance with

CRANE SEDIMENT SEPARATORS

Crane Sediment Separators positively and automatically trap foreign matter in fluid handling lines—steam, water, air, oil or gas, high or low pressure—and hold it for easy removal.

Dirt, scale, sand and other injurious particles are prevented from damaging or spoiling product and ruining valve seats, automatic devices and other delicate equipment.



Vertical Types

Because of their exceptionally large screening areas—more than 500% greater than pipe area—Crane Sediment Separators assure unrestricted flow of product, even when partially plugged. Note special blow-off connection for drain valve attachment which permits easy cleanout without interrupting flow service.

LITERATURE SENT ON REQUEST

Available in both Y-patterns and vertical types, with full range of capacities and sizes. For literature on Crane Sediment Separators, see your Crane Representative or write to address below.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

When inquiring check 8185 opposite last page

food regulations

(Continued from preceding page)

Celery: Proposed revisions include deletion of the Combination grade which is now seldom being used; that the product be green unless specified as fairly well blanched or mixed blanch, and a change in requirements for heart formation to more nearly describe Pascal celery. The proposals also include revision of shape requirements for stalks of each grade, and are somewhat more restrictive on trimming in Extra No. 1 and No. 1 grades. Tolerance for soft rot is changed to permit only 2% of the stalks to be affected. Application of tolerance statement is amended to make it more applicable to the packing of the product in cartons and consumer packages. Comment was due May 26.

Squash: Standards are being proposed for the first time to cover canned summer-type squash. Any common table varieties of summer squash used in the immature stage may be classified under the proposed standards which provide for Grade A or Fancy, Grade C or Standard, and Substandard. Quality would be determined by evaluation or color, defects, and character. Views and comments are due by June 17.

Frozen sweet peppers: Final order has now been issued amending standards to exclude excessive amounts of seeds, core, and stem material. The change will take effect about mid-June.

Walnuts: Minor changes are proposed for the product in its unshelled form. Involved are adjustments and several additions in size classifications to bring them into line with modern industry practices.

Honey in prune juice affects processor's business

FDA standards of identity may materially affect the business of W. F. Straub & Company, processors of Lake Shore brand honey and prune juice. FDA has informed the processor that honey should not be used in prune juice since the latter is covered by official standards, and honey is not listed as an optional ingredient. (Suggestions to prevent such standards' problems are found in article beginning on page 20).

plants companies personalities

E. E. Stewart

Armour & Co. has appointed **Dr. J. A. King** as director of research.

Kroger Co. has appointed **Charles W. Pike** manager of its Cincinnati manufacturing plant.

Carl H. Haurand moves to vice president in charge of manufacturing at **Best Foods, Inc.**

At Quaker Oats: **Lavern A. Hertzler** becomes manager of Chicago sales office.

Donald D. Rietow moves to secretary at **Dole Hawaiian Pineapple Co.**

New executive vice president at **H. J. Heinz Co.** is **Frank Armour Jr.**

At **P. Ballantine & Sons, Roland F. Roche** is now general merchandising manager.

Two regional appointments at **Wesson Oil & Snowdrift Sales Co.: Pierce L. Brothers,** vice president, Pacific Coast Div., and **Harold C. Fisk,** vice president, New Orleans Div.

Dodge & Olcott, Inc., announces opening of competition for 1957 Achievement Award for outstanding contributions in meat packing industry. Details are available from the company, located at 180 Varick St., New York 14, N. Y.

At **Canada Dry Ginger Ale, Inc., R. W. Moore, Sr.,** is now chairman of the board and chief executive officer. His son, **Roy W. Moore, Jr.,** is now president.

New responsibilities at **National Dairy Products Corp.: E. E. Stewart** is now chairman of the board in addition to being president; **J. Huber Wetenhall** is executive vice president; **J. Clyde Loftis,** president of **Kraft Foods subsidiary,** is vice president of the corporation.

Jean J. Charest has been elected president of **The Borden Co., Ltd.,** Canadian subsidiary of the US firm.

Nathan Cummings, chairman of the board at **Consolidated Foods Corp.,** recently received France's Chevalier of the Legion of Honor, in recognition of his services in furthering appreciation of French art.

Dr. Thomas F. Protzman has joined **A. E. Staley Mfg. Co.,** as leader of the evaluation group in the research division.

Helmco, Inc., announces appointment of **R. A. Steiner** as general sales manager.

New vice president in charge of sales at **Jacob Ruppert Brewery** is **Walter S. Driskill.**

Celebrating its 50th anniversary this year, C. H. Musselman Co. has chosen the golden apple as its anniversary symbol. On hand to salute the company at recent banquet was Heidi Nickey, Eastern Cherry Pie Queen

(Turn to next page)

Continuous, Trouble-Free Operation for...

DRY DUST CONTROL

If you're airing a dust control problem for industrial process or community relations . . . consider the factual benefits of field-proven Ducon Cyclones for dry collection. Hundreds of leading plants throughout the world, handling a wide variety of products, have found that Ducon dry-type collectors provide the continuous operation needed to capture nuisance dusts and recover usable product . . . most effectively, and with no processing down-time for sludge clearance. Consult a Ducon field engineer who may have a ready answer for your specific dust control problem.

Write today for descriptive Bulletin No. DC-49

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TAPER-LOCK BUSHING MOUNTS FLUSH

- NO FLANGE
- NO COLLAR
- NO PROTRUDING PART

The Perfect Conveyor Pulley for Food Processing

TAPER-LOCK STEEL CONVEYOR PULLEY

There's nothing like it for clean, modern design. No flange, no collar, no protruding part! And its drum type construction—*with Taper-Lock*—excludes steam and water.

All welds are made by the submerged arc process. The ultimate in strength is achieved by means of an unique back-up bar (patent applied for) which permits welds of full rim thickness.

Like all Dodge Taper-Lock products, Taper-Lock Steel Pulleys are quickly and easily installed—or demounted—yet they hold with the firmness of a shrunk-on fit. The bushings are interchangeable in Taper-Lock sheaves, sprockets and couplings.

Ask your Dodge Transmissioneer to show you how this superior conveyor pulley can be profitably put to work on your conveyor lines.

DODGE MANUFACTURING CORPORATION
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CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new methods. Look for his name under "Power Transmission Machinery" in the yellow pages of your phone directory. Or write us.

DODGE of Mishawaka, Ind.

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industry news

(Continued from preceding page)

A. N. McFarlane

Alexander N. McFarlane is now president of **Corn Products Sales Co.**

Quaker Oats announces appointment of **U. B. Shockley** as product sales manager of corn goods.

Expansions-Mergers

Dixie Cup Co. has merged with **American Can Co.** through an exchange of stock . . . **Green Giant** announces plans for construction of $1 million office-plant facility in Tecumseh, Ontario . . . **Gordon Foods, Inc.,** has started building a new 180,000 sq ft plant in Atlanta.

Food Research Laboratories has acquired a new headquarters building in New York City, doubling their present space . . . **Realemon-Puritan Co.** of Chicago, is now having all its ReaLemon brand products packed by **Minot Food Packers, Inc.** of Bridgeton, N. J. . . . Construction begins in July of new **Foxboro** manufacturing plant in Foxboro, Mass.

Consolidated Products Co. announces opening of new plant for making whey at Galena, Ill. . . . **Neptune Meter Co.** has acquired controlling interest in **Hot Spot Detector, Inc.** of Des Moines . . . **Millstadt Milling Co.** has been purchased by **Meletio Co.** of St. Louis.

Thomas D. Richardson Co., Philadelphia candy manufacturer, has merged with **Beatrice Foods . . . Kelco Co.,** is building a new $250,000 research lab in San Diego . . . **Consolidated Foods** has acquired **Phillips Packing Co.** of Cambridge, Md. . . . **Rockwood & Co.** has sold its Chocolate Division to **Sweets Company of America.**

Dracket Co., Cincinnati has sold its soy protein business and facilities to **Archer-Daniels-Midland . . . Lady's Choice Foods,** has purchased the **Wellman's Coffee** plant in Los Angeles.

conventions and exhibits

June 11-13. Western Plant Maintenance & Engineering Show and Conference, Civic Auditorium, San Francisco.

June 20. Arwell, Inc., Sanitation Seminar, Hardware Mutuals Auditorium, Stevens Point, Wis.

June 26-28. American Society for Agricultural Engineers, Michigan State University, East Lansing.

June 26-29. American Dairy Science Assn., annual meeting, Oklahoma A&M College, Stillwater.

July 22-24. National Macaroni Manufacturers Assn., annual convention, Grand Hotel, Mackinac Island, Mich.

August 26-29. American Society for Horticultural Science, annual meeting, Stanford University, Palo Alto, Calif.

August 26-28. American Phytopathological Society, annual meeting, Stanford University, Palo Alto, Calif.

August 28-30. International Symposium on Gas Chromatography, Michigan State University, East Lansing.

Sept. 8-11. National Frozen Food Distributors Assn., national convention, Hotels Sherman & Morrison, Chicago.

Sept. 9-13. Instrument Society of America, annual conference and exhibit, Public Auditorium, Cleveland.

Sept. 15-18. Produce Packaging Assn., annual conference and exposition, Shoreham Hotel, Washington, D.C.

Oct. 9-11. Fourth Annual Symposium of High Vacuum Technology, Hotel Somerset, Boston, Mass.

Oct. 14-16. Second International Sanitation and Maintenance Show and Conference, Navy Pier, Chicago.

Oct. 20-25. Milk Industry Foundation, Dairy Industries Supply Assn., International Assn. of Ice Cream Mfrs., dairy convention week, San Francisco.

Oct. 21-25. National Safety Council, Chicago.

Oct. 28-31. National Industrial Packaging and Material Handling Exposition, Convention Hall, Atlantic City, N.J.

Tape that holds in freezing cold!

So cold-resistant, it holds at 40° below zero . . . so wet-proof, it transmits less moisture than even a wax-impregnated carton. "Scotch" Brand Acetate Fibre Tape is tough, long-aging, dimensionally stable, *and printable;* meets government packaging specification JAN-P-127. 12 colors: red, green, orange, blue, orange-yellow, light green, yellow, light blue, white, black, silver, and gold, plus transparent. Ask your "Scotch" Brand Tape distributor about acetate fibre tapes, or send for complete descriptive folder.

Always specify "Scotch" Brand, the *quality* tape . . . and stick with it!

ACETATE FIBRE TAPE . . . *one of over 300 Pressure-Sensitive Tapes, trademarked* . . .

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The term "Scotch" is a registered trademark of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

PRODUCT OF 3M RESEARCH

Look what you can do with it!

SEAL surface-treated cartons quickly, easily with "Scotch" Brand Acetate Fibre Tape and "Scotch" Brand Type M Box Sealer. Short strips of tight-sticking tape are applied automatically as box is passed over roller.

ADD labels or premiums to cans and boxes, or to product itself. *Printed* "Scotch" Brand Acetate Fibre Tape can be applied automatically to any flat surface with "Scotch" Brand Flat Surface Applicator.

TREATED wrappings, paper, cartons, etc. present no problem to printed "Scotch" Brand Acetate Fibre Tape. Special adhesive sticks at a touch . . . holds securely despite cold or moisture.

SEND FOR FREE FOLDER describing properties and uses of "Scotch" Brand Acetate Fibre Tapes. Just write on your letterhead to 3M Co., St. Paul 6, Minn., Dept. IF-67.

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"We have found
Exact Weight Scales
to be the best . . ."

. . . says A. L. Green, Vice President and General Sales Manager of Jekyll Island Packing Co., Brunswick, Georgia

Mr. Green tells us: "They have given us such good results that we have replaced all other scales with Exact Weight equipment."

Jekyll Island Packing Company has depended entirely on Exact Weight Scales for accurate weighing of all its packages for the past several years, now having no less than 18 units in daily use throughout the plant. The fast-weighing, fast-reading, long life and minimum of maintenance with Exact Weight Scales make them ideally suited for use in food processing.

You'll find Exact Weight Scales in leading food plants throughout the country. Give yourself the same advantages. Write today for full details on the complete line of Exact Weight Scales for food processors and packers.

Model 213 Exact Weight High-speed Production Scale. Requires small counter space; weighs accurately in out-of-level positions; working parts treated to resist corrosion, capacity 3 pounds.

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Exact Weight SCALES

BETTER QUALITY CONTROL . . . BETTER COST CONTROL

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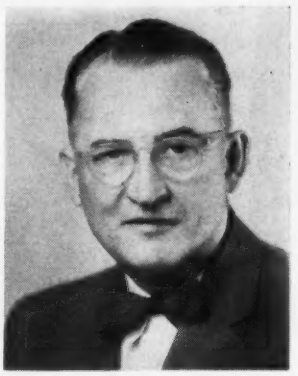
association news

Trade Associations
Technical Societies
Colleges



George P. Larrick

Norman F. Greenway

George P. Larrick, FDA Commissioner, is one of the ten recipients of **National Civil Service League's** 1957 Career Service Awards. These are bestowed for outstanding dedication, talent, and ability in Federal career service.

FLAVOR-SEALED IN ★ Waxed Paper ★ FOR YOUR PROTECTION

Waxed Paper Merchandising Council has introduced this distinctive seal, to be used in all the Council's advertising and promotional programs. It's expected also to appear in the future on waxed paper package designs.

National Red Cherry Institute elections: president, H. B. Pearson; vice president, Ben F. Batcheler.

John L. Harvey, Deputy FDA Commissioner, is one of five recipients of this year's USDHEW Distinguished Service Awards.

Among the recipients of the **National Safety Council's** 1956 Public Interest Awards were Abbotts Dairies, Inc., Jewel Food Stores, Joseph Martinson & Co., and Pan-American Coffee Bureau.

Paraffined Carton Research Council reports that 43% of all ice cream and frozen desserts sold in 1956 were packaged in paraffined cartons.

Re-elected president of the **Folding Paper Box Association** is Norman F. Greenway, Robert Gair executive.

American Public Relations Association has awarded General Mills its Silver Anvil trophy for its program of providing blind homemakers with package mix baking instructions on records.

Massachusetts Institute of Technology (Cambidge, Mass.) begins its special summer program in food technology this month. Topics to be covered in one and two week sessions include flavor, research, marketing, work simplification, nutrition, additives, isotopes, antibiotics, rheology, radiation.

New member of board of directors at **American Meat Institute** is Floyd Segel of Wisconsin Packing Co.

Dr. Buell Beadle is new manager, **Chemistry Division, Midwest Research Institute.** He succeeds Dr. John T. Goodwin, who moves to technical director, **Corn Industries Research Foundation.**

Two appointments at **American Meat Institute Foundation:** Dr. James Evans, chief, bacteriology division; and Dr. J. Walter Giffee, chief, hide research division.

National Canners Association announces appointment of Charles T. Townsend as associate director of its Western Research Laboratory at Berkeley, Calif.

This year's Prescott Fellowship, awarded by **Institute of Food Technologists,** goes to Robert E. Hughes, graduate student at the University of California.

Canned applesauce accounted for 15.8% of dollar sales of all canned fruits in 1956, higher than any other single canned fruit, according to **Processed Apples Institute, Inc.**

New chairman of the board of **Waxed Paper Institute** is George J. Cadotte of Central Waxed Paper Co.

Northwest branch of the **National Canners Assn.** has moved into new facilities at 1600 Jackson St., Seattle, Wash.

Stanford Research Institute is expanding its radiation research facilities by acquiring a 1-mev GE resonant transformer beam-electron generator. This unit allows further studies on effects of radiation with foods as well as other materials.

1957 Gold Medal of the **American Institute of Chemists** has been awarded to Dr. Roy C. Newton, Swift & Company.

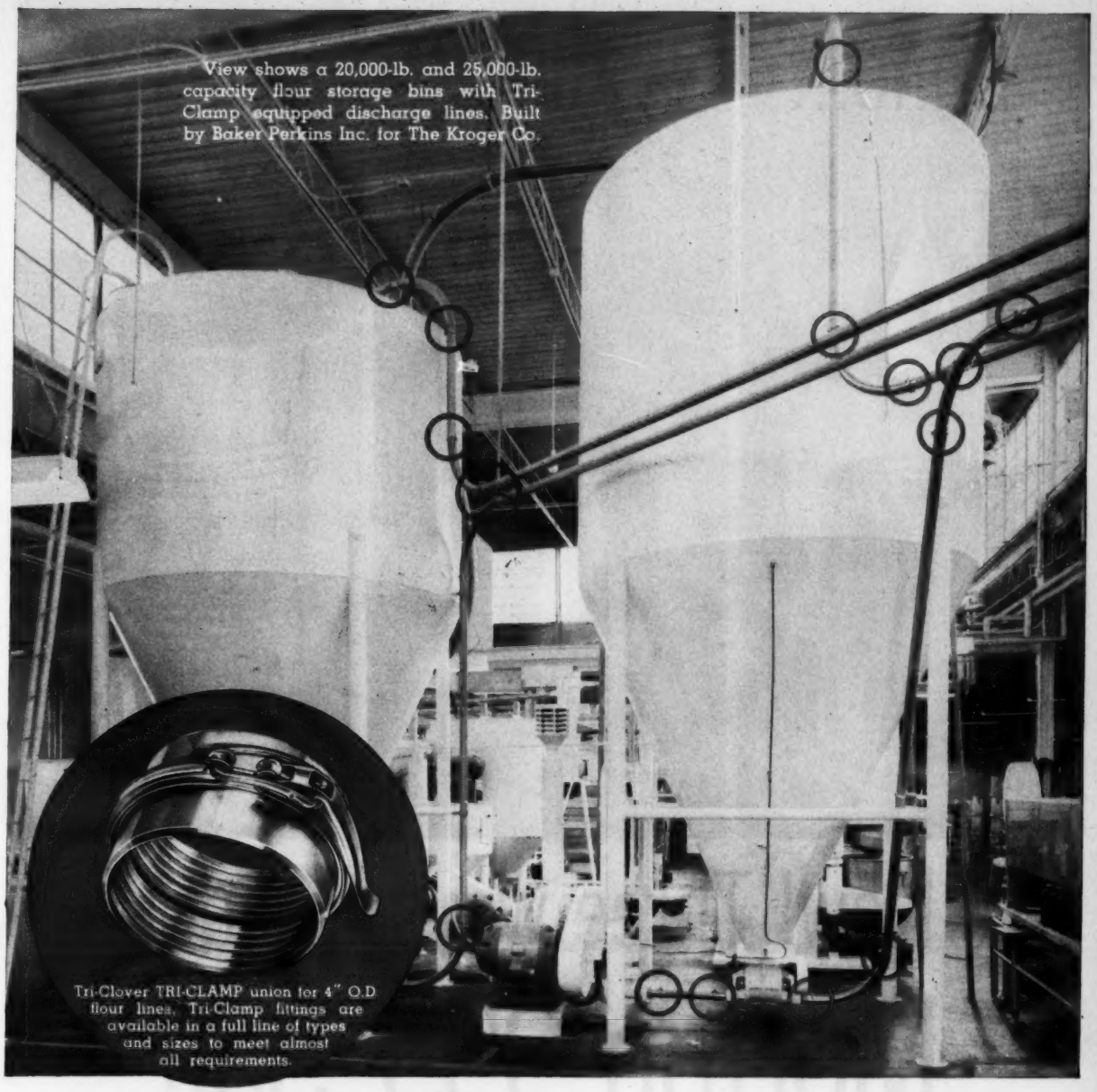
New director of the Michigan State University Fruit and Vegetable Processing research is Dr. Georg Borgstrom.

Donald H. Williams succeeds Dr. John L. Barnhart as technical director of **Dairy Industries Supply Assn.** Mr. Williams has been active in the work of the 3-A Sanitary Standards for Dairy Equipment committees. Dr. Barnhart has returned to dairy collegiate educational work.

W. T. McGillivray, controller, California Packing Corp., San Francisco, has been elected a vice president of the **Controllers Institute of America.**

Industrial Research Institute, an organization composed of the nation's top scientists, named Dr. T. H. Vaughn as president. Dr. Vaughn is executive vice president for corporate development, Pabst Brewing Co.

Series of articles on present status of Radiation Preservation of Foods begins this issue on page 24.



View shows a 20,000-lb. and 25,000-lb. capacity flour storage bins with Tri-Clamp equipped discharge lines. Built by Baker Perkins Inc. for The Kroger Co.

Tri-Clover TRI-CLAMP union for 4" O.D. flour lines. Tri-Clamp fittings are available in a full line of types and sizes to meet almost all requirements.

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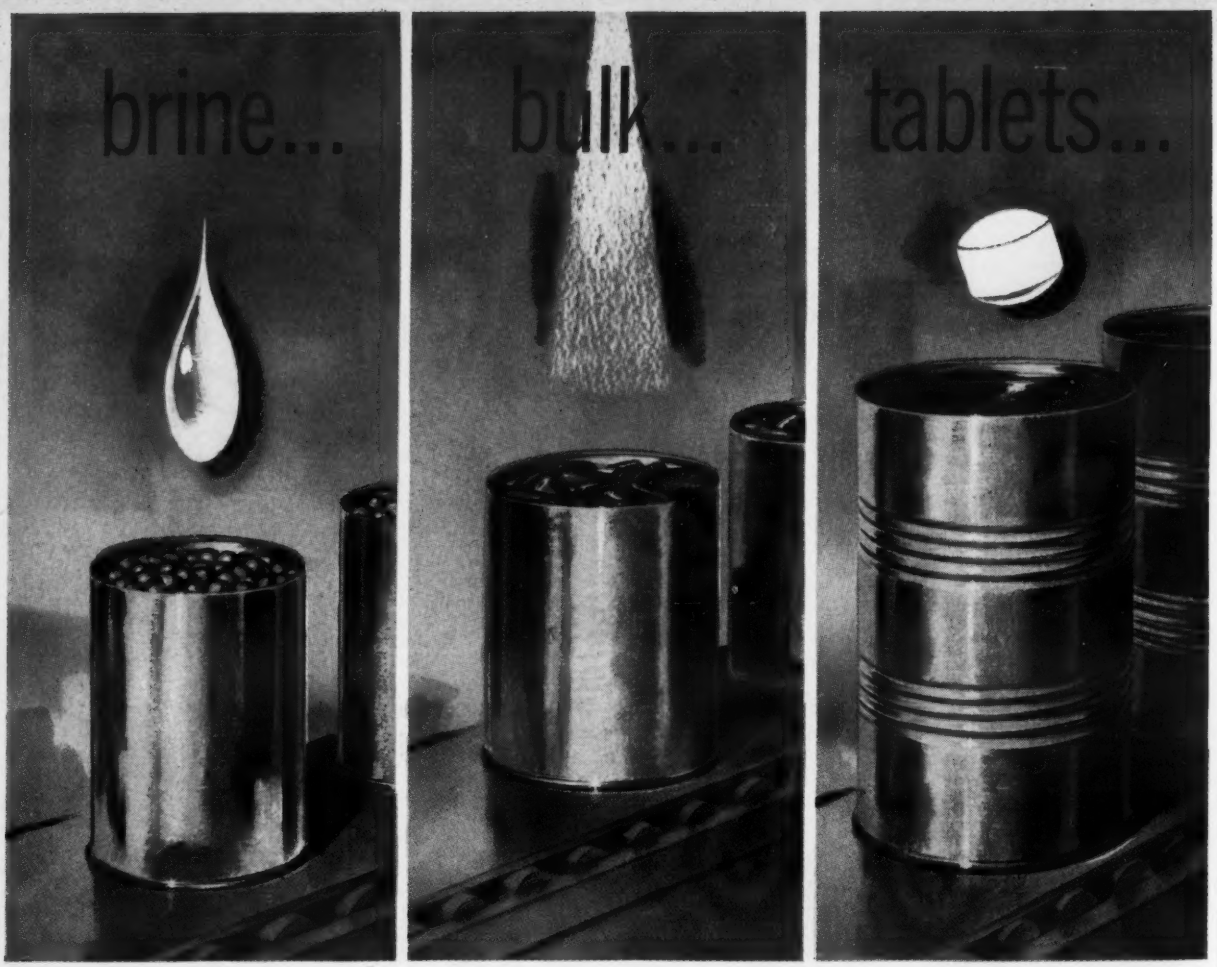

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New vistas for research and development

Last month FOOD PROCESSING called attention to the view of Dr. Frank Gunderson, technical consultant, that the "principle of food standards of identity has yet to be proven sound". Dr. Gunderson argued that food standards forestall addition of other wholesome and nourishing ingredients as well as discouraged research and development which would lead to improved forms and composition of foods.

This month Michael Markel, a lawyer expert in the food and drug law, demonstrates that this problem can be greatly minimized by restricting the standardization concept to that presumably originally intended by the Congress. That is, limiting standards to the essentials required for insuring inherent honesty or economic integrity without compromising other legitimate consumer interests.

Howard P. Willens

EDITOR

food processing
for Men Who Manage
Volume 18 Number 6

Pending legislation will eliminate the need for FDA to shift to industry the burden of proof for establishing safety of food additives via the all inclusive recipe-type of standards of identity. It is therefore timely to consider suitable amendments restricting food standards to fixing only those factors which are essential to food identity and establishment of economic integrity and thus

UNSHACKLE

The improvement of food products

MICHAEL F. MARKEL
Author of the Hale Amendment

THE need for standardizing foods, particularly fabricated foods consisting of two or more basic or characterizing ingredients, was abundantly demonstrated before Congressional committees over a period of six years prior to enactment of enabling legislation in 1938 authorizing the promulgation of official food standards having the force and effect of law

That legislation was supported by government, consumer groups, and food industry groups. Standardization was indicated for the protection of both the consumer's pocketbook as well as the protection of reputable members of the industry against unfair methods of competition on the part of the inevitable few who will undersell by debasing foods — that is by progressively lowering the content of costly ingredients and increasing the content of less costly ingredients including water.

Legal standards essential

The evidence before the Congressional committees demonstrated, to their satisfaction, that certain practices of dilution of food integrity did exist which could not be corrected by truthful labeling. Legal standards were deamed essential to insure inherent food honesty or *economic integrity,* namely, standards of food honesty, having the force and effect of law, which consumers would normally expect either by reason of accepted household practices or by reason of standards maintained over some period of time by reputable manufacturers.

This demonstrated necessity for legal standards to insure food honesty continues to exist, since the need for protection of consumers and the safeguarding against unfair methods of competition is as real now as it was twenty years ago. Nevertheless, the experience to date under the food standards law warrants a critical appraisal of the impact upon these basic objectives of the standards in their practical operations.

(Turn to next page)

Removing Serious Obstacles to Development of Improved Food Products (*Continued from preceding page*)

MICHAEL F. MARKEL is author of the Hale Amendment, which is widely recognized as having greatly simplified procedure followed in promulgating food standards. He was formerly senior attorney, General Counsel's Staff of the Food and Drug Division, Federal Security Agency, which post he held until 1943. While with the government he participated in drafting procedural regulations for food standard hearings, and participated in many hearings—sometimes as government lawyer but more often as presiding officer.

Since leaving the government he has been associated with virtually every important food standard hearing. His clear incisive views on legal matters pertaining to foods and drugs have won for him the greatest respect among those of the legal profession as well as those in government circles. At present he is practicing attorney of Markel & Hill, Washington, D. C., specializing in the field of the food and drug law.

Recipe writing or standardizing?

Much could be done to ease the food processors' burden of food standardization without compromising the indicated legitimate consumers' interests. This could be achieved by restricting standardization to basic essentials. These are fixing of the required ingredients to insure the identity and fixing of their ratio to other ingredients by establishing floors for the expensive ingredients and ceilings for the inexpensive ingredients.

The standards now being promulgated go away beyond this. They are virtual recipes. As we have said on a prior occasion (and not altogether in jest either) as now administered, the food standard law constitutes the Secretary chef-in-chief of the Nation. He is the final authority to say what may be used in a standardized food and what may not be used. This includes ingredients which, we submit, are not essential to maintain the economic integrity but rather fall in the realm of culinary art or other technical improvements which have no bearing on the economic integrity.

They are usually referred to as "optional" ingredients; that is, ingredients of the officially prescribed list which the food processor may, at his own option, put in or leave out of the food. However, he may not undertake to improve either the texture, color, flavor or some other characteristics of his food by going outside of that list even though the addition of such other ingredient would not affect the economic integrity of the food in the least. He may not knowingly use new ingredients or new formulations which have no bearing on the economic integrity of the food but would serve to cater to the anticipated consumers' desires or conveniences.

Fixing optional ingredient not essential to economic integrity

This kind of standard, it is submitted, is not necessary to achieve the objective of the food standards law — namely, inherent food honesty or economic integrity. This seems to be readily indicated by the legislative history of the food standards law.

The principal examples of food dilution which were brought before the Congressional committees were fruit preserves and chicken noodle soup. It was pointed out that the housewife had from time immemorial made her preserves by using one cup of fruit, one cup of sugar, and enough water to allow cooking to the desired consistency. Reputable manufacturers had been marketing a preserve containing not less than 45 per cent of fruit to approximate that formula. However, through progressive competitive pressures, many brands of preserves were then found on the market containing about half or less than half of that much fruit, which the consumer could not readily distinguish from the standard products.

Chicken noodle soup, it was shown, had been and was being diluted by some to a point where only about 7 per cent of chicken solids were used, in comparison with about 15 per cent in the products considered standard. There were other examples, but these were stressed and sufficed to illustrate the point.

It is submitted that if the floor for the fruit is fixed at 45% (i.e., 45 lbs of fruit to 55 lbs of non-fruit solids) and the minimum concentration of the total solids is specified, then the inherent economic integrity of the preserve remains estab-

*Food standards of identity are promulgated by the Secretary of the Department of Health, Education and Welfare through his Food and Drug Administration.

lished no matter what ingredients other than fruit may be added to achieve a desired organoleptic or physical effect.

The same is true of chicken noodle soup. Once the minimum percentage of chicken solids, (and perhaps noodles) is fixed and is required, under penalty of law, to remain so fixed, then it is difficult to imagine any circumstances under which the economic integrity of such soup may be impaired by adding other ingredients to promote the desired culinary refinements.

Insurance of economic integrity was the basic objective of the food standards. In passing the Food Drug and Cosmetic Law, which authorized administrative standards, the Congress provided other rather detailed separate and distinct provisions calculated to exclude from interstate commerce foods rendered *deceptive* or *unsafe* by addition of ingredients of questioned safety or ingredients which will cause the food to appear to be something which it is not. The failure to make this distinction between foods lacking in inherent economic integrity by reason of dilution and those rendered deceptive or unsafe by addition of certain ingredients has resulted in the kind of standards now being promulgated.*

Existing standards go beyond demonstrated needs

It is true that there is always the likelihood that an unscrupulous food processor under the guise of improvement will make a food "appear better or of greater value than it is", or will "conceal inferiority", or will in some other way "abstract a valuable constituent therefrom", without affecting the *economic* integrity of that food. However, Congress has not left these practices to be controlled by food standardization. It has provided expressly, in other parts of the law containing the quoted words, that such practices are unlawful and that any food so rendered deceptive is adulterated and subject to seizure. Furthermore, the responsible persons are subject to injunction and liable to criminal prosecution.

Congress has, therefore, provided ample tools for dealing with *deceptive* foods as distinguished from those of a *diluted* integrity.

Enforcement of these so-called "economic adulteration" provisions of the law involving deceptive foods has never been difficult, whereas foods of diluted integrity were not reachable under the 1906 law because no standards existed having the force and effect of law.

"Safety" via standards a temporary expedient

The other justification for a recipe type of standard sometimes advanced, is the necessity for insuring "safe" foods. However, this need exists for *all* foods whether standardized or not. Therefore Congress has dealt with this subject very carefully and rather extensively in the law.

Any food which contains any ingredient which "may render such food dangerous to health" is adulterated and, as such, is an outlaw of commerce subject to seizure and the responsible persons are subject to injunction and liable to criminal prosecution. Nevertheless, the problems posed by the practical enforcement of this part of the law do provide an acceptable argument for all inclusive standards.

Under the present law the Government is required to establish affirmatively, by court proof, that the questioned ingredient of a food "may render" such food "dangerous to health". This can only be done after exhaustive toxicological and pharmacological studies of the ingredient which, usually require about two years of controlled investigations.

It is readily apparent that, from the standpoint of both the time and funds required to develop such court proof, the Government is faced with an impossible enforcement task. By adopting the type of all inclusive recipe standards now being promulgated it has become possible for the Government to shift this burden of proof to the food processor via the standard-making route where the food processor is required to establish affirmatively, by proof acceptable to the Secretary, that the proposed ingredient is safe.

Indeed, one may assert that this has been the primary consideration in the promulgation of certain standards, because *there are standards that appear to have been promulgated not so much to fix the ingredients which establish the identity of the food and to fix floors for the expensive and ceilings for the inexpensive ingredients, but rather to exclude ingredients of questioned safety.* The courts have accepted this as a valid consideration in promulgating food standards. However, in all probability, this need will soon be eliminated if legislation now pending before Congress is enacted into law (cf pages 46 to 49 of May FOOD PROCESSING).

Several bills are pending before Congress at this time which, if passed, will serve to eliminate the considerations just mentioned. When such legislation is enacted into law, as is most likely, then the safety of all "new additives" will have to be established before they may be used in any food without regard to the existance of food standards.

Then the proponent of an ingredient will have to establish its safety under the proposed conditions of use before it can be used at all. Hence, there no longer will be any occasion to consider the safety of proposed ingredients at food standard hearings, and the most plausible argument in support of the recipe type of standard will have been eliminated.

Let food technologist be chef

Thus, without resorting to food standard procedure the economic adulteration provisions of the law are adequate for dealing with *deceptive* foods, and anticipated food additive legislation will provide an adequate means for insuring *safe* foods. Therefore, it is timely to give serious consideration to the more simple type of standard adequate for insuring the inherent honesty or *economic integrity* of foods, which I maintain was all that was intended when the food standard law was passed.

Under the proposal revised statutory setup the Secretary and food technologist can again assume their proper function — the food technologist as chef, the Secretary as Regulator.

This important article on changing the Food Standards of Identity will be available in reprint form. Single copies without charge; quantity prices on request. Address The Editor, FOOD PROCESSING, 111 East Delaware Place, Chicago 11, Illinois.

*One may speculate with interest how the courts might have construed the food standards law had this distinction been urged in some of the original cases involving this question. However, this question was not raised until fifteen years after the law was passed, when the court accepted the administrative interpretation which did not recognize this distinction.

Current status of radiation preservation o

DR. BRUCE H. MORGAN

Deputy for Radiation Preservation, Office of the Scientific Director, Quartermaster Food and Container Institute for the Armed Forces

Highlights of Dr. Morgan's Article

- Irradiation can be expected to serve only as an adjunct to refrigeration for fresh fruits and vegetables because their extreme susceptibility to radiation-induced textural changes precludes use of high dosages.
- Irradiation is by far the best potato sprout inhibitor discovered . . . but it apparently offers no prospects as a decay inhibitor.
- A softening effect resulting from irradiation of peas may actually be desirable for mature raw materials.
- Lettuce and celery seem the most susceptible of the vegetables to radiation-induced damage.
- Gamma irradiation of lemons and oranges increased storage life more than 400% for each.
- Initial work indicates flour can be made insect-free with dosages in the 30,000-70,000 rep range, stored 9 months at 100° F and make a satisfactory loaf of bread.
- A major advance appears underway in milk. Simultaneous removal of volatiles during the irradiation process has prevented "irradiated" flavor.
- Considerable progress has been made in refinement of techniques geared to detection of chemical components that appear to contribute to both odor and flavor in irradiated foods.
- For Cl. botulinum destruction, a minimum dosage of 4,800,000 rep is now calculated as necesary to satisfy public health requirements and to achieve commercial sterility. This level will be re-evaluated as research progresses.
- Preliminary results look highly promising in the combination of antibiotics and radiation, especially in fowl.
- Repeated measurements and theoretical calculations reaffirmed that irradiated foods are not radioactive at energies used.
- Data from animal feeding experiments do not indicate any production of toxic compounds by radiation sterilization or preservation.
- Long-term feeding of chickens, rats, and dogs has demonstrated irradiated foods to be the equal of their respective controls as evaluated by rate of growth, reproduction, hematology, food consumption, and food efficiency.
- Human volunteers fed diets of which irradiated components provided 35%, 65%, 85%, and 100% of total calories showed no adverse effects of any kind.
- Limited troop taste-testing of irradiated foods will begin in 1958, and troop consumption experiments are anticipated by 1960.

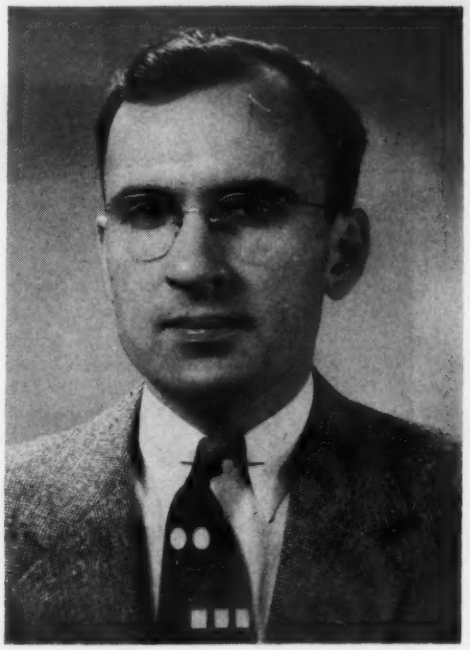
IN 1954, the Army Quartermaster Corps was made responsible for research into radiation preservation of foods and for development of radiation as a commercially feasible processing technique. The long-range objective having been determined, the next step was to attain it! Tactics employed to date might be likened to these of a military campaign. A number of immediate and intermediate objectives (problems) were established and an all-out effort launched on a broad front. One or more scientific teams were assigned to attack each problem area, using as a "base of operations" the body of knowledge represented by a particular science, and employing as weapons the latest scientific instrumentation and techniques.

Under simultaneous study are radiation effects on whole foods and food components, mechanism of radiation-induced odor, color, flavor and texture changes, microbiological aspects, control of enzyme activity, toxicity, wholesomeness, packaging, radiation sources, dosimetry, and economic feasibility. Chemists, biochemists, microbiologists, physicists, chemical engineers, and psychologists

*Based on material presented by Dr. Morgan at the Annual Meeting of the Research and Development Associates, Food and Container Institute, Inc., Richmond, Virginia, April 23, 24, 25.

*Editor's footnote: The findings reported here constitute presumptive evidence based on still limited data. Verificatory work actively continues to build up an adequate backlog of evidence.

# of foods*



DR. BRUCE H. MORGAN directs an investigative program that involves the participation of approximately 100 universities, research organizations, and industrial laboratories, and the full-time efforts of some 20 Quartermaster Corps scientists, technologists, and administrative assistants. Formerly a research microbiologist with National Canners Association, Washington, D.C., he came to the Quartermaster Food and Container Institute for the Armed Forces, Chicago, in December 1953 to help organize and head up the Quartermaster's emerging food radiation program. In 1955, with expansion of both the internal acceptance evaluation phase and the external contract program, Dr. Morgan was named Deputy for Radiation Preservation in the Office of the Scientific Director of the QM Institute.

distributed throughout more than 100 organizations have been penetrating the scientific no-man's land of radiation preservation under the Quartermaster banner.

Interchange of reports and periodic general conferences furnish the necessary liaison information for this wide-spread scientific "army". Here, then, is the latest "communique" on progress in applications research.*

Radiation effects on whole foods

Meats and Fish

Good acceptability has been noted for sterilized (2 million rep and higher) raw and cooked oysters, bacon, ham, corned beef, chicken, and raw pork immediately after irradiation (no storage prior to taste-test). The raw oysters and raw pork were subject to enzyme spoilage on storage, indicating need for mild heat treatment along with radiation. Using less than sterilizing doses (1,000,000 rep) plus refrigeration, a 2- to 4-fold increase in shelf life has been reported for mackerel, halibut, scallops, and clams. With use of antibiotics in conjunction with irradiation, one might expect an even greater increase in the refrigerated shelf life.

Fair results were secured with raw tuna, halibut, trout, beef, veal, and lamb and poor results with salmon (pigment destruction), bologna, and frankfurters.

Promising trends with meats for military use involve both sterilization and pasteurization, with emphasis toward partial heat treatment (for enzyme inactivation or for palatability) to produce ready-to-eat items. An example of this research is the study to determine amount of grilling or broiling before irradiation that is best to produce a ready-to-eat or partially cooked steak. Use of condiments, formulations and methods of cooking (cooking methods leading to browned products tend to mask flavor) might play important roles in production of flavorful products. Irradiated raw meat demonstrates an increased respiration rate due to the radiation process, but this falls below normal after 48 hours' storage. The significance of this phenomenon in terms of flavor or keeping quality has yet to be determined.

Fruits and Vegetables

Irradiation can be expected to serve only as an adjunct to refrigeration for fresh fruits and vegetables because their extreme susceptibility to radiation-induced textural changes precludes use of doses of over several hundred thousand rep.

Irradiation is by far the best potato sprout inhibitor discovered, being superior to the chemical 3-chloro-IPC, maleic hydrazide, and napthalene acetic acid, but it apparently offers no prospects as a decay inhibitor. Experimental evidence shows that radiation influences certain physiological processes of potatoes whereby natural protective mechanisms are disturbed. Extent of such disturbance depends upon strength of dosage. Work is underway to determine amount of radiation required to effectively arrest sprouting without inducing other harmful changes.

Spinach, green beans, and sweet potatoes given sterilizing doses were acceptable after 4 months at 50° to 100° F. Irradiated solid pack sweet potatoes were better than irradiated syrup pack; both were very well accepted. Broccoli, blanched for 2 minutes and given 750,000 rep, was held an extra week at 45° F.

A softening effect resulting from irradiation of peas may actually be desirable for mature raw materials. The fixation of green also was reported in one experiment in which peas were irradiated in brine after blanching before heat treatment; however, other workers reported

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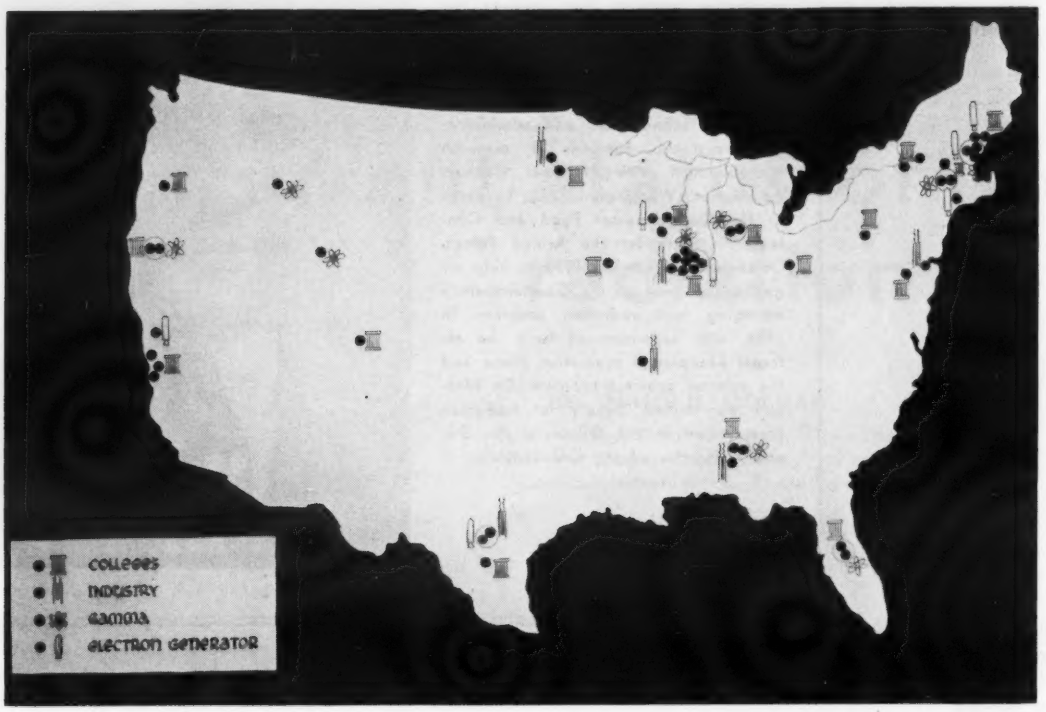


The food radiation contract research program embraces college and industrial research laboratories, government and industrial radiation sources from coast-to-coast . . . border-to-border. Hub of this national network is the Quartermaster Food and Container Institute for the Armed Forces, Chicago.

no irradiation effect on the setting of green color.

Better retention of sweetness and tenderness was reported for fresh corn-on-the-cob, irradiated at 200,000 rep, packed in non-perforated polyethylene bags and held 3 weeks at 40°F. However, at 50°F, the life of the corn was appreciably shorter due to development of unacceptable flavor and texture.

Irradiated whole heads of cabbage held up well in storage at 40°F, after a 500,000 rep treatment. Storage life of cole slaw at 38°F was doubled after a sterilizing dose.

Doses of 250,000 to 300,000 rep can exert some control on the growth of a common rot, **Alternaria tenuis,** in tomatoes; this treatment lengthened market life at room temperature for 7-10 days.

Lettuce and celery seemed the most susceptible of the vegetables to radiation-induced damage, both suffering from destruction of texture at dosages that would kill spoilage organisms. In addition, celery takes on an objectionable, non-celery flavor. Brussels sprouts developed an off-taste after 2 weeks at 45°F.

Gamma irradiation of lemons and oranges at 150,000 rep controlled both **Penicillium digitatum** and **Penicillium italicum.** Irradiated oranges, previously inoculated, could be held 65 days at 38°F as compared with 15 days for unirradiated controls. Irradiated lemons could be held 22 days at the usual 55°F, contrasted to only 4 or 5 days if not irradiated. The appearance of fruit remained unaffected at this level of gamma irradiation. However, fresh lemons showed a breakdown of peel oil and peel pectin and degradation of juice quality. Irradiation apparently caused faster yellowing of green lemons in other tests.

Although pineapple chunks had a highly significant reduction in bacterial count at 100,000 rep, the amount of kill achieved was not sufficient to provide appreciable extension of shelf life. Immediately after irradiation, the unirradiated product was preferred. However, because of the more rapid degradation of the control, this difference had disappeared after 3 to 4 weeks at 35°F.

Apple slices at sterilizing doses were acceptable, while pasteurizing doses applied to fresh Delicious and Spy varieties added 5 months to storage life at 33°F.

At sterilizing doses, fresh apricots were not satisfactory. Peaches and ripe Bartlett pears held at 40°F did not show any benefit from irradiation. However, the reported slowing down of the ripening of Bartlett pears is looked upon as a possible benefit needing further investigation.

Because effective decay control methods for them are not now available, cherries, apricots, peaches, blueberries, strawberries, and raspberries are considered good irradiation research products.

Further study is needed on effect of irradiation on respiration of fruits and vegetables. Temperature of commodity at time of irradiation, humidity (particularly in respect to its effect on susceptibility of mold spores to irradiation), composition of the atmosphere, and kind of container used must be regarded as possibly important. Radiation treatment may have to be modified in accordance with variety, maturity, previous product history (such as climate under which it was grown), and presence of incipient infections or diseases or serious mechanical damage.

Grains, Cereals, and Baked Foods

Initial work indicates flour can be made insect-free with dosages in the 30,000-70,000 rep range, stored 9 months at 100°F and make a satisfactory loaf of bread. The aim is not necessarily to kill the in-

sect but rather to disrupt the metamorphic cycle to prevent reproduction. One source has found that cakes made with irradiated flour were of progressively poorer quality with increasing doses of gamma radiation (above 100,000 rep), had low total volume, were heavier, gummier, and had a darker yellow crumb color. Furthermore, the gluten appears to lose its binding power and the flour has a drier or more starch-like texture in mixing. Flavor changes were noticeable in cakes made with bread flour given 100,000 rep. After 150,000-250,000 rep and 42 day storage at 40-60°F, biscuit doughs lost elasticity and produced baked biscuits that evidenced objectionable off odors.

In irradiated waffles, 100,000 rep seemed the threshold above which offensive odors were produced and flavor lost. Experimentally, it was found that substituting mineral oil for the regular hydrogenated vegetable shortening significantly reduced flavor degradation. Flavor and texture changes in pancakes given an electron dose of 1,000,000 rep were noticeably greater than changes during exposure to the same level of gamma irradiation.

Effect of moisture may be important when assessing radiation damage. Irradiation of batter ingredients in a dry state generally produced better results than irradiation of batters. Conflicting evidence has been presented on effectiveness of replacing air by nitrogen, oxygen, or carbon dioxide in irradiating certain cereals and baked goods.

Dairy Products

A major advance appears to be underway in milk which can be sterilized by irradiation without adverse flavor changes. The technique involves the simultaneous removal of volatiles during the irradiation process. It is presumed that these volatiles, if not removed, enter into chain reactions to form the substances primarily responsible for the highly offensive "irradiated" flavor.

Spices

These do not seem to suffer ill effects when exposed to irradiation in the range of 20,000 to 70,000 rep. At doses between 70,000 and 150,000 rep, cinnamon showed a very slight loss in characteristic flavor.

Storage of irradiated foods

There appears no evidence of a difference between fresh beef, veal, pork, and lamb so far as stability following irradiation is concerned. Each undergoes proteolysis during storage at non-refrigeration temperatures. Rate of proteolysis at 40°F is sufficiently low to permit reasonably long storage at this temperature. Uncooked, cured meat appears not to undergo measurable proteolysis during storage after irradiation. Ground beef irradiated at 3,000,000 rep, although not highly acceptable when tested shortly after irradiation, appears to improve in color and flavor during storage. Foods which appear to change little, if any, during normal storage periods following irradiation are:

Sterilized	Pasteurized (plus cool)
Ham	Beef slices
Bacon	Poultry
Blanched liver	Carrots
Blanched poultry	Broccoli
Blanched scallops, halibut, oysters, shrimp	Cole slaw
Blanched sweet potatoes, green beans, broccoli, spinach	Tomatoes
Blanched apple slices, peaches	Apples

As indicated, these foods had been either heat-treated or held during storage at refrigeration temperatures, either of which would prevent or slow enzyme action. It should be remembered that irradiation is intended to achieve protection from the major sources of food spoilage—microbial activity and insect infestation. However, it is not to be expected that irradiation alone will offer significant protection from enzyme activity. Irradiated foods like all others undergo gradual degradation over long periods of time owing to interaction between the many components of these products.

Next month, Dr. Morgan's article will conclude with a discussion of radiation's effect on food components, microbiological findings, wholesomeness, toxicity studies and economics of gamma vs. electron sources. See July FOOD PROCESSING.

U.S. Army ionizing radiation center scheduled to begin pilot production of foods in fall 1958

Intended as a prototype of a manufacturing or processing plant, the planned U. S. Army Ionizing Radiation Center will provide economic data which can be extrapolated to future food production lines. Scheduled for completion by fall 1958 at Sharpe General Depot, Lathrop, Calif., the Center's 75,000 sq ft processing area will have a capacity of 1000 tons of food/month or 3000 lb/hr, if in operation 24 hrs/day, 28 days/month. (Except during seasonal runs of highly perishable crops, a normal 40-hr, one-shift week is anticipated.)

To minimize delay in changeover from one commodity to another, two processing lines will be equipped to sterilize or pasteurize all types of foods, beginning with those currently found most promising for ration use. At present, equipment plans are being developed for 26 foods. In addition, latest concepts in packaging equipment and methods will be incorporated.

Immediately important will be a comparison of gamma vs. electron irradiation of foods from the standpoints of cost and effect on taste, odor, color, and texture of raw products. To insure significant results, items with known histories and identical methods of pre-processing will be treated by the 2 different methods. A secondary aim will be to produce in quantity irradiated foods for further testing by the Quartermaster.

Department of Army is planning the plant, exclusive of the gamma facility at an estimated cost of $4,500,000. Construction, except for nuclear components, will be by the Army Corps of Engineers.

Varian Associates, Palo Alto, Calif., are building a $600,000 radio frequency traveling wave electron linear accelerator for the plant. For foods, it must be capable of irradiating packages as large as 6"x16" x20", whose density is 1 gm/ml, at a rate of 1000 tons, when operating 28 days/mo, 24 hr/day. Radiation dose delivered to such a food package must not vary more than 25% from maximum to minimum throughout the entire volume of the package. Specifications: rated power — 18 kw; beam energy at rated power — 24 mev; radio frequency — about 2856 mc; pulse rate — 360 pps; pulse length — 5.6 microseconds. The unit will use a magnetic deflection system to send alternate pulses into opposite side of the object to be irradiated. It will use electro magnets to scan the beams

(*Turn to next page*)

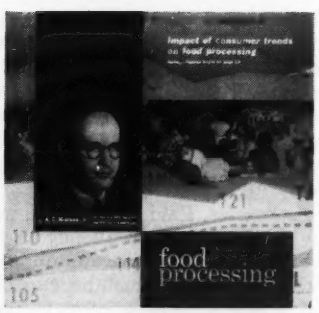
Radiation

(*Continued from page 27*)

across object to be irradiated.

Design and construction of the special reactor, ancillary reactor equipment and four radiation chambers — estimated total cost $3,000,000 — is the responsibility of the Atomic Energy Commission. Current conceptual design for this gamma facility involves building a MTR-type reactor of 10.5 megawatt (a megawatt = 1000 kw). Core of this reactor will be surrounded by a blanket of indium sulphate or some other indium salt in solution. This salt will be activated and then pumped away from the reactor and from the neutrons to the irradiation chambers. The elements in these chambers are so designed as to give maximum dose rate and to handle the packages required by the specifications. The reactor concept currently is being refined by Kaiser Engineers, San Francisco, Calif.

In overall charge of progress on the Center is Col. Joseph L. Mastran, Commanding Officer, Quartermaster Radiation Planning Agency, Washington, D. C.



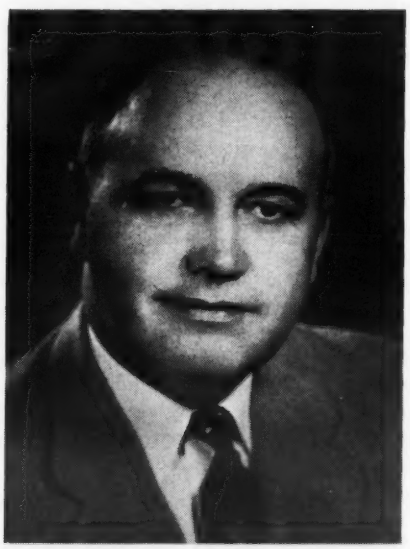
Impact of Consumer Trends on Food Processing

Consumer trends and what they mean to food processors in the development of new products was treated comprehensively by A. C. Nielsen in his article in the February issue of FOOD PROCESSING. A twelve-page magazine-size reprint of the article is available from The Editors, FOOD PROCESSING, 111 East Delaware Place, Chicago 11, Illinois. Single copies, 50c quantity prices on request.

HTST canning methods, combined with subsequent refrigerated storage, upgrade and retain quality offering

TREMENDOUS P

In the May issue of FOOD PROCESSING the bright future for canned foods was pointed out in an article summarizing the remarks of Dr. Esselen and Dr. Clifcorn. Dr. Esselen emphasized that high retention of quality can be achieved by refrigerated storage. Dr. Clifcorn described how higher initial quality can be obtained by various High-Short methods. This month, Dr. Clifcorn presents a detailed outline of these High-Short methods. His article is based on the paper which he presented at the Symposium "The Future of Food Preservation" held in April at Midwest Research Institute.



DR. L. E. CLIFCORN

Supervisor, Container Utilization Section, American Can Co.
formerly Director of Fundamental Research, Continental Can Co.;
President, Institute of Food Technologists (1955-56)

EXPERIENCE has shown that the factors of quality in canned foods, such as color, flavor, texture and vitamin content, are most effectively preserved by high temperature-short time processes. In general, it may be postulated that the destruction of bacteria increases tenfold for each 18°F. (10°C) rise in processing temperature, while the chemical reactions responsible for product deterioration are only doubled. Bacteriologically equivalent processes for shorter times at higher temperatures (above 250°F) likewise effect a greater preservation of the natural characteristics of the products being canned. Several of these have been tried or are in commercial use. They may be classified as follows:

1. High temperature-short time processes followed by aseptic filling and closing:

A. *The HCF Process:*

Ball describes this process by stating that it "provides for the operations of sterilizing empty containers, sterilizing and cooling covers for the containers, sterilizing a food material in bulk, putting the sterilized food into the sterilized containers and applying the sterilized covers to seal the containers. All operations in handling the sterilized objects until after the containers are sealed are performed under aseptic conditions which are maintained in closed chambers by a pressure of steam greater than that of the outside atmosphere."

About 16 years ago the HCF Process, sponsored by the American Can Company, went into commercial use in processing a chocolate flavored milk beverage, and the process has been used continuously on that product. A sterilizing temperature of 280°F to 290°F for one minute is used for sterilization. A most desirable quality is obtained. Similarly, vastly superior quality was demonstrated

POTENTIAL FOR CANNED FOODS

in dairy products, vegetable purees, cream style corn, and other products as compared with the same products sterilized by conventional methods.

B. *The Avoset Process:*

This process went into operation on a canned cream about 1942. The process is similar to the HCF Process, except that the filling and closing operations are carried out in an air conditioned room at atmospheric pressure. A positive flow of air into the room provides an outward flow of air through the opening which discharges the sealed containers from the room.

The product is sterilized by the Grinrod Process wherein steam at 35 to 55 psi pressure is jetted into the product to heat it quickly to 260°-280°F. The product is held at this temperature to complete the sterilization after which it is condensed in an evaporator, cooled and homogenized. Bacteria is kept out of the holding tanks by a positive flow of bacteria-free air and ultraviolet lights. This operation has been successful in producing a commercially sterile cream product of outstanding quality.

C. *The Martin Process:*

In the Martin Process the product is sterilized and cooled in the same manner as in the HCF Process, but the containers are sterilized by employing superheated steam at atmospheric pressure instead of saturated steam under high pressure.

The Martin Process has been used successfully on Avoset cream and whole milk. It has been shown capable of producing 32 different varieties of sterilized food having much better flavor and color than control samples processed by conventional methods.

D. *The Smith-Ball Process:*

This process was conceived on the basis of a canning room operating under approximately 20 lbs of pressure. At this pressure water boils at 259°F and foods and equipment may be sterilized very readily with room pressure steam or hot water immersion within the room. Workers operating under 20 lbs of pressure must pass through compression and decompression chambers. This process was directed at eliminating heavy pressure vessels, reducing heating requirements and providing faster processing rates. There is no commercial installation of this process in operation today.

2. Agitating processes of liquid and semi-liquid products in can

A. *Agitating-Vacuum Process:*

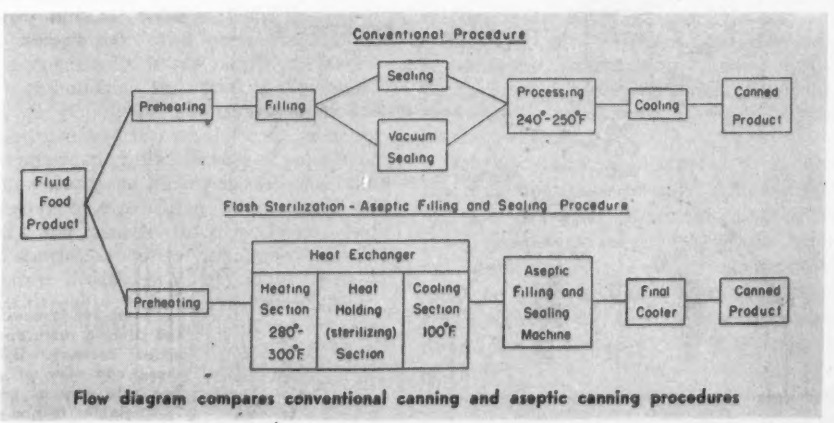
In the late 1920's a process for quality improvement, known as vacuum pack, was introduced. By this process products such as whole kernel corn and peas are packed under high vacuum with only a small amount of liquid and then processed in the regular manner. Roberts and Sognefest showed that an advantage could be gained by employing agitation during the process to accelerate the process and make possible a reduction in processing time. This activity was largely confined to revolving crate-type cookers. During 1946 several canners used the agitating process for vacuum packed corn.

B. *The Thermo-Roto Machine:*

In 1944 the Green Giant Company conducted experiments with a small scale can rotation-type cooker which was open to the atmosphere and utilized a high boiling point liquid (glycol)) as the heating medium. This unit, known as the Thermo-Roto machine, consists basically of a series of parallel rollers, spaced to accommodate cans and rotate them at the desirable speeds. The cans are sprayed with the liquid heating medium. The cans are conveyed across the rollers with pusher arms and cooled on another deck with water sprays. Extremely heavy plate is required for the ends of the cans used in this process to prevent buckled cans from the high internal pressures created.

A pronounced improvement in the quality of the vacuum packed corn receiving this process was attained, with the result that in 1948 a plant scale machine was installed and operated.

(*Turn to next page*)



Flow diagram compares conventional canning and aseptic canning procedures

C. *Food Machinery and Chemical Corporation Continuous Pressure Cooker-Cooler:*

The first commercial scale continuous cooker to be developed was the so-called Anderson-Barngrover Cooker, which operates on the principle of conveying the cans in a helical path on a rotating reel in which the cans roll as they travel along the lower part of the periphery with each turn of the reel. This equipment has been used successfully for evaporated milk for many years. Attempts to use it on cream style corn, over a period of thirty years, were unsuccessful until a special starch was developed which prevented coagulation when the cans were agitated. The Sterilmatic Process, made possible by the special starch and the mechanically induced convection, reduces the process to 16 minutes at 275°F with markedly better color and flavor than obtained from the conventional method of processing.

D. *The Agitort Process (End-over-End Rotation)*

This process involves end-over-end rotation of the sealed can during processing at a speed such that the centrifugal force acting upon the can approximates the force of gravity. Such rotation is effective in accelerating the rise of temperature of the entire contents of the containers to a greater degree than any other type of container movement.

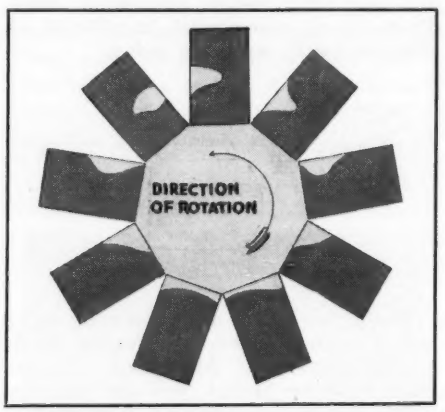
Considerable improvement in the texture, flavor, color, and thiamine retention of many heat-sensitive products has been achieved with no overcooking or scorching taking place. The principle is particularly adaptable to large can sizes and enables many products such as pureed vegetables, creamed soups, various milk products to be packed in both small and large can sizes without heat impairment of quality beyond that of kitchen-cooking.

3. High temperature short time sterilization of the liquid product, followed by sufficient heat to destroy "air-borne" contamination during filling and closing.

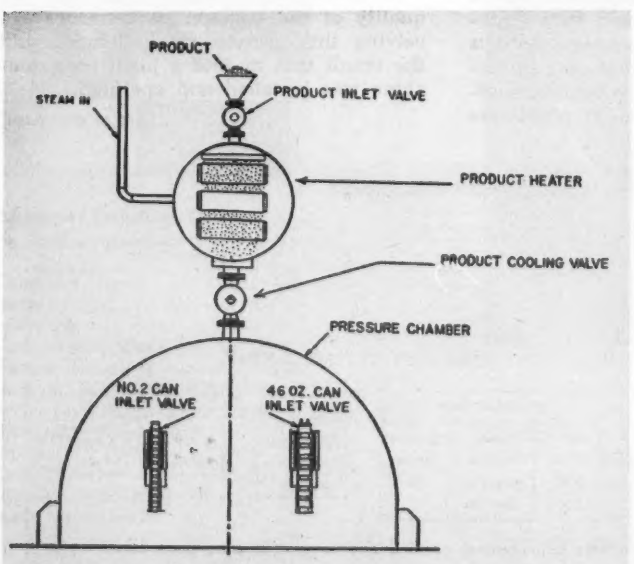
A. *Pre-sterilized tomato juice:*

The disastrous outbreak of spoilage in tomato juice in the 1930's due to Bacillus thermoacidurns led to the development of a pre-sterilizing technique by which sterilization of tomato juice with reasonable limits of bacterial contamination could be assured. A short heat treatment at 250-270°F in a suitable heat exchanger is given the juice to destroy heat resistant acid tolerant bacterial spores prior to filling into containers. The filling of the juice at a minimum temperature of 190°F and holding for three minutes prior to water cooling serves to kill bacteria of low resistance that re-enter the product during filling.

There has been a rapid acceptance of this method, with the result that there are at least a hundred such installations in use today.



In Agitort process, cans are rotated end-over-end while traveling through retort. Optimum speed of rotation (where centrifugal force approximates gravitational force) is shown in this diagram



In Smith-Ball Process, entire canning room operates under pressure. Diagram shows end view of chamber, side view of product heater section

4. Modified Technique for Preparing the food product for processing, followed by using a conventional method in processing.

A. *Strata-Cook Process:*

Another method of speeding up the sterilization of products, consisting of a mixture of discrete particles and a finely divided component in a liquid such as water or brine, was developed by Ball and is known as the Strata-Cook Process. The process depends upon assembling the three components in the containers in a specified manner so that they can be stratified and kept separated during the heating of the container for sterilization. After heating has been accomplished, the components are mixed.

The method saves from 40 to 60 percent in sterilizing time, and yields a product of markedly improved nutritive and organoleptic quality.

What does the future hold

The high temperature-short time processing of certain products has achieved commercial success. Applications include the end-over-end agitating process for whole kernel corn in brine and for whole milk; the agitating-vacuum process for vacuum packed whole kernel corn; the flash process (HCF) for tomato juice, utilizing only partial cooling before filling; and the HCF process for chocolate milk, cream, whole milk, creamed soups and a few other products.

The reluctance of the canning industry to accept these improved canning techniques to enhance the quality and nutritive value of canned foods is explained solely on the basis of the economics in-

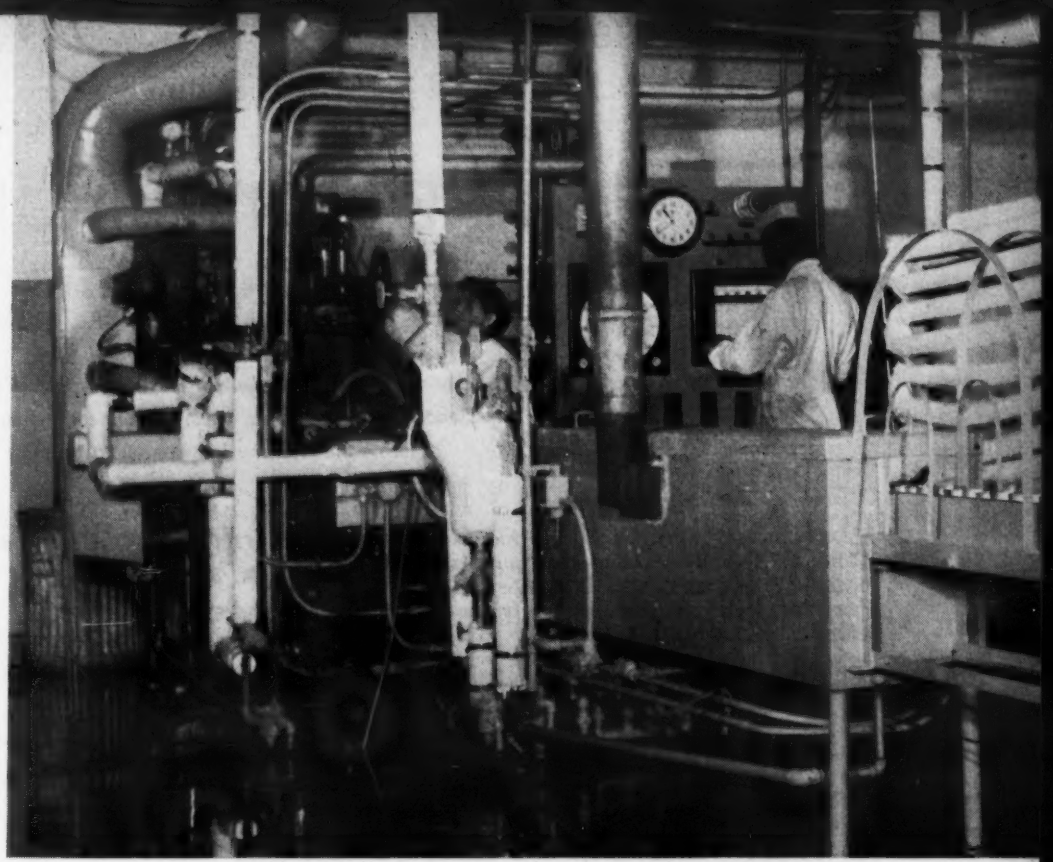
volved. For vegetable canners, capital must be able to be amortized on a four-to-six-week-per-year operation. In most instances the economics are worked out so closely that the seasonal packer cannot afford expensive equipment. That is why the lower cost synchronized batch agitating cookers may meet the pocketbooks of the seasonal canners better than expensive automatic cookers.

HTST impractical in some cases

At this point I must emphasize that some products are not materially improved by high-short processes. Peas of higher sieve sizes and maturities are an example. A certain amount of heat is necessary for cooking and the high-short cook is not enough. Also, as is the case with many products, the improved quality apparent by the high-short process dissipates rapidly upon regular temperature storage. The whole class of fruits might also be mentioned as not being sufficiently improved by high-short processes to pay for the added cost of the equipment. The romance of some of these new processes has cost many a man a tidy fortune because he did not consider the factual advantages of the new process, storage and non-inactivated enzyme included, before making the investment.

There is still a lot of room for a comprehensive factual analysis of the improved acceptability of all processed foods by some of these high-short methods as compared with the conventional canned foods we are buying today. The facts are that not all products will respond with improved quality to high-short processes and retain this improved quality in our regular warehouses and merchandising channels. Whole kernel corn, cream style corn, creamed soups, whole milk, cream, and some pureed vegetables are products that respond favorably.

There is room for considerably more research. The significance of improper destruction of enzymes was first announced by Guyer and Holmquist as a result of high-short processes on peas. The peroxidase enzyme in this work was more heat resistant than the bacteria. The lethality of the agitating process for peas, therefore, has to be adjusted to destroy peroxidase. In the case of carrots, they can be high-short processed, but are still crisp like a raw carrot. Here the cooking requirement of the process is the factor determining the time and temperature of the heat process.



Empty cans enter can sterilizer at right in Martin aseptic process as used at Anderson's Foods. Products pass through jacketed heat exchanger behind cans at right

In Ball's excellent article, "Food Sterilization Methods — The Future," he stated "The freshly cooked quality possessed by the food immediately after heat sterilization can be preserved for any reasonable storage period — perhaps for two or three years — by storing the product at 32-36°F". He further stated that for common storage the cost is about one cent per pound per year, storage at 32-36°F less than two cents, and storage 0-15° less than three cents per pound per year. Now let us consider some storage-sensitive foods such as orange juice and whole milk. These products, shortly after canning by the best heat processing methods, are of the highest acceptable quality, almost indistinguishable from fresh orange juice and pasteurized fluid milk, respectively. In six months of average warehousing, the typical "canned" flavor is popularly voiced against the orange juice and the whole milk assumes an evaporated milk flavor. Typical of human nature, we have gone all the way to frozen orange juice concentrate to remedy the orange juice problem, and milk continues to be delivered every other day. If these products could be held in their freshly canned state at 32-36°F, they would retain their high acceptable quality for over a year.

The foregoing is my first example of what I mean by saying combination processes will offer new methods of preserving foods tomorrow. The cool warehousing of canned foods can bring tremendous accomplishments for improved quality of canned foods and will expand to the advantage of the canner and the consumer.

Another combination process showing possibilities is that of heat plus antibiotics. Wheaton, Burroughs, and Hays announced last year that tomato juice inoculated with Bacillus thermacidurns did not undergo off-flavor spoilage when 5, 10, or 20 ppm of subtilin were employed with a mild heat treatment. Similarly, radiation plus mild heat has definite possibilities since Kempe reported that mild irradiation materially lowered the heat resistance of botulinum organisms.

Mild heat plus refrigeration or freezing is common today for many heat-sensitive products or formulated foods. This combination treatment will no doubt expand in the future.

Dehydro-canning of apples and cherries has been successfully demonstrated by the Western Regional Laboratory group. In this process over half the original water in the product is removed, followed by a mild heat treatment. Space and weight saving results in an excellent retention of quality of the original product.

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DETERMINE MOISTURE IN CANDIES IN LESS THAN FIVE MINUTES

No grinding necessary—nuclear magnetic resonance technique is independent of particle size. Deviates from conventional methods of moisture analysis by less than 0.2% in most cases

T. F. CONWAY, R. F. COHEE, and R. J. SMITH

Corn Products Refining Company

Experimental work at Corn Products Refining Co. indicates that the "nuclear magnetic resonance" technique for determining moisture can be applied successfully to many candy products. This rapid, non-destructive technique (described in detail in April, 1956 issue of FOOD PROCESSING) has been used successfully in the past for moisture testing of many corn milling products, and correlates well with conventional analytical methods.

Candy products tested in this study included moulding starch, soft jellies at depositing and at packaging, jelly bean centers at depositing and before panning, juju type candy, marshmallow, candy corn, fondant, grained mints, and chicle. Table I indicates deviations of all these tests from correlation—greatest average deviation is only 0.24% (for juju type).

T. F. Conway and R. J. Smith are members of the Analytical Group, Research Dept, Chemical Division, of which R. J. Smith is Section Leader. R. F. Cohee is Sales Service Manager, Central Division, Corn Products Sales Company.

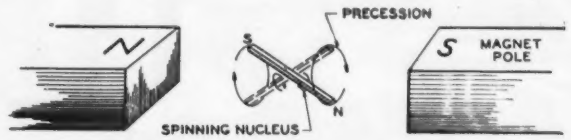
This article is based on paper presented at the 11th Annual Production Conference of the Pennsylvania Manufacturing Confectioners' Association.

No special skill is needed to operate equipment—for routine measurements only the "start" button need be touched. Adjustment of instrument parameters is necessary in some instances, but these can be made routinely without difficulty.

In making the measurements, weighed sample cell is filled to predetermined depth and sample weight determined (or constant sample weight can be used). Cell is sealed and placed in sample cavity of instrument. Strength of magnetic field is then altered over narrow range to obtain derivative curve. Measurement of peak-to-peak amplitude requires only about 30 seconds.

TABLE I Sample Type	Figure No.	No. of Samples	Moisture Range %	Approximate Sample Weight (gm)	Sample Cell Size	Deviations from Correlation % Moisture	
						Average	Maximum
Moulding Starch, new and recycled	10	9	4.9- 8.2	35	Large	0.07	0.15
Corn Syrup	11	10	15.1-24.5	15	Large	0.17	0.7
Soft Jellies, at depositing	12	7	21.5-24.9	8	Small	0.09	0.20
Jelly Bean Centers, at depositing	13	7	22.2-25.5	8	Small	0.17	0.25
Jelly Bean Centers, before panning	14	7	11.7-14.5	40	Large	0.04	0.10
Soft Jellies, at packaging	15	5	15.2-16.4	18	Large	0.10	0.20
Juju Type Candy, at packaging	16	5	14.3-16.1	35	Large	0.24	0.40
Marshmallow, circus peanut	17	13	3.1-10.8	25	Large	0.10	0.30
Fondant, candy corn	18	7	4.0- 7.5	35	Large	0.12	0.25
Grained Mints	19	5	0.0- 1.9	30	Large	0.10	0.20
Chicle	20	18	0.1-21.4	40	Large	0.18	0.80
Chicle ratio measurement	21	11	0.1-14.4	30	Large	—	—

Table summarizes study at Corn Products of correlation between NMR moisture determinations and conventional methods for various candy products



ALIGNED WITH MAGNETIC FIELD

ALIGNED OPPOSED TO MAGNETIC FIELD

Diagram indicates how hydrogen nuclei align themselves and precess (wobble) in magnetic field

Here's how the method works

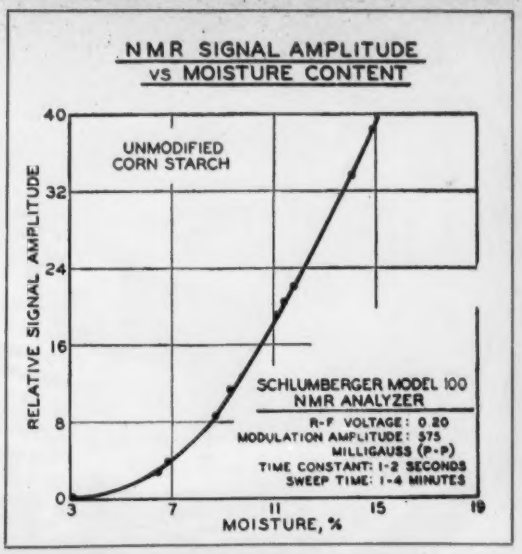
The NMR technique is actually a measure of number of hydrogen nuclei present, rather than water molecules, but it is relatively easy to distinguish between signals (readings) of hydrogen present as water, and hydrogen in other forms.

Basic measurement in NMR is the absorption of radio frequency energy by the nucleus of the hydrogen atom. Hydrogen nuclei in water can be considered similar to spinning tops with permanent bar magnets along axis of rotation. Normally, they are oriented in random fashion.

When placed in a strong magnetic field, however, they tend to align themselves either with or opposed to the magnetic field (parallel or antiparallel). This alignment is not rigid—the nuclei "wobble" or precess (see above). Freqency of this precession is dependent on magnetic and inertial properties of nucleus and is proportional to strength of the field.

Exposing the nuclei to an additional, radio frequency magnetic field, at right angles to first field, and having frequency equal to precession frequency, will cause some of the nuclei to reorient from parallel to antiparallel position. In this forced reorientation process the nuclei absorb energy from the radio frequency field. Amount of energy absorbed is proportional to number of hydrogen nuclei present, and thus to amount of water present.

Typical calibration curve, for unmodified corn starch



Prototype NMR analyzer used in the Corn Products study

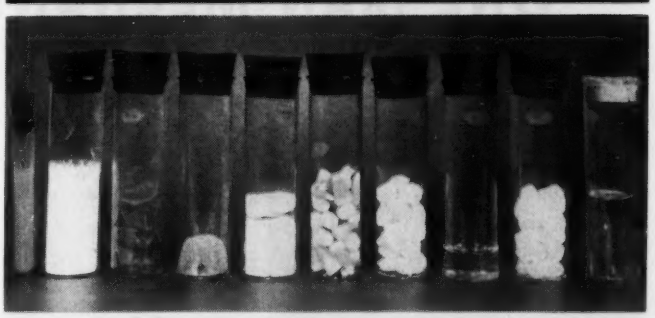
Calibration curves for specific materials are made by determining peak-to-peak amplitudes for the material at various moisture levels, and plotting these against moistures of same material at these levels, determined by conventional means.

Samples are generally tested on "as is" basis, without maceration or grinding of any kind. (It's even felt that this adds to precision since there is no possibility of losing moisture during grinding). Method can be applied to wide variety of sample types—in the Corn Products study it successfully replaced four conventional types of moisture determinations: vacuum oven, azeotropic distillation, refractive index, and conductivity.

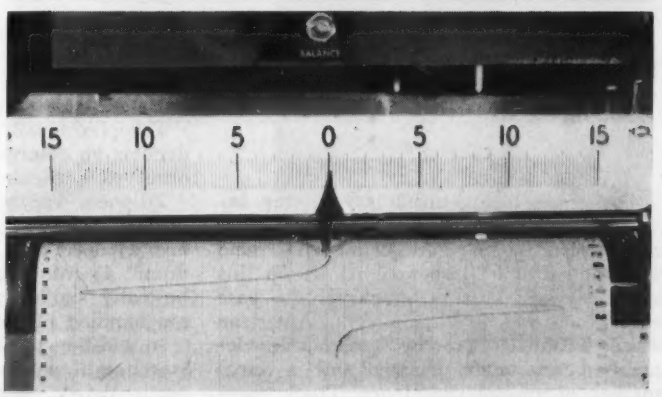
Cost of instrument is presently about $10,000, but it's felt that as the unit comes into production, the price will be reduced considerably.

(Supplier of the instrument used for the Corn Products study is Schlumberger Well Surveying Corp., Dept. FP, Ridgefield, Conn. . . . or for more information check 8192 on form opposite last page.)

Candy products which were tested: (from left to right) soft jellies before depositing, moulding starch, juju type, soft jelly at packaging, marshmallow, fondant, grained mints, corn syrup, jelly bean centers, chicle



Typical curve for starch at 15% moisture



Getting rid of plant refuse, processing residues was big problem until we adopted

ONE MAN MECHANIZED HANDLING OF WASTE FOR $30,000 SAVING

JAMES J. McCABE, Industrial Engineer,
American Maize Products Co.
as reported by Joseph L. White, Product Editor

Truck operator pictured is receiving instructions via radio telephone to pick up container of spent char from lactic acid processing. Photo (upper right) shows this job underway. This is typical of the ease with which waste is handled at American Maize Products Co. by pick-up device mounted on truck chassis and a large number of special containers. Truck services over 30 waste accumulation points per 8 hour day, handling residues, solids, liquids, rubbish, waste paper, trash, and assorted metal scrap.

The phone call dramatized in the picture denotes an emergency. Generally, the truck observes a regular schedule.

To meet varying requirements four different types of containers are used. These are: 1) open box; 2) closed box; 3) bottom dump; 4) end skip over dump. They are all basically similar with design features that aid handing of specific loads.

In addition to char there are wastes from starch, mill, and refinery divisions. Dust that accumulated on roof of feed house was formerly swept off manually and then shoveled into truck. Now, a dust collector handles it, discharging into a waiting container.

Under conventional waste collection method, several dump trucks were needed with waste and rubbish being shoveled manually.

With one-man mechanized handling, driver merely backs up truck to waiting container, dismounts from cab and attaches lifting links. Returning to cab he uses simple controls which put into operation two hydraulic cylinders which are attached to head frame. Boom raises container onto skid frame. Container is then moved forward on frame hydraulically. Boom also lifts containers for dumping. Truck travels be-

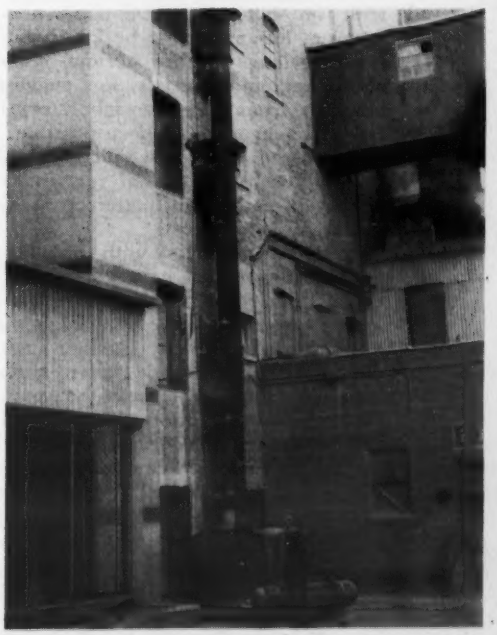
American Maize Products Co., Roby, Ind. Physical plant covers 25 of the 83 acres comprising entire tract

Two-way radio keeps driver of waste truck in touch with plant

Spent char dumps directly into a container for transfer to plant dump. No accumulation in piles—no shoveling by hand

Load is dumped without driver leaving truck cab. Hydraulic cylinders provide positive, fast action

- **Controlled collection provided by self-dumping containers**
- **Picked up by truck with two-way radio communication**
- **Better housekeeping for entire plant area of 35 acres**



Here, container receives miscellaneous trash, waste from five different floors

tween 75 and 100 miles per day in traversing the 35 acres encompassed by actual plant facilities and in making trips to plant dump area. Entire tract covers 83 acres.

Savings enjoyed since system was put into operation amount to $30,000 a year in labor alone. No dust, no blowing trash, no unsightly piles of rubbish or hazardous accumulations of scrap, pipes, metal, lumber.

One of the most profitable applications of the system, however, is in salvage work. Containers, always in place on a stand-by basis, aid collection of scrap and separation of pipe, fittings, valves, etc. Material to be sold can be stockpiled for pick-up. That marked for reuse by plant can be transferred to suitable storage. Material of no value is easily dumped. In one year over 700,000 lb of segregated iron was handled, each item being delivered to its indiyidual pile. Scrap paper handled last year amounted to 300,000 lb.

An indirect but most important benefit lies in contribution to better community relations. Protection of neighborhood from dust and dirt has been a potent force in building good will.

(System described is called Dempster Dumpster, developed by Dempster Brothers, Dept. FP, Shea Building, Knoxville 17, Tenn. . . . or for more information check 8193 on form opposite last page.)

Minor modifications for large volume items add up to

over $1 million reduction in packaging costs at Heinz

KARL F. LANG,
Head, Packaging & Sterilization Dept.
H. J. Heinz Company*

During the past year, a concentrated effort has been made by our company in seeking ways and means of reducing packaging costs. A constant review of current packaging specifications coupled with an extensive packaging research program has proven to be fruitful. Much credit belongs to the various suppliers of packaging materials for suggestions resulting from their own laboratory findings. Whenever it has been possible, they have passed on to us savings resulting from better utilization of raw materials, improved methods of manufacture, or reduced operating costs.

Frequent meetings with suppliers of packaging materials have been most beneficial. We have been able to enjoy savings of over $1 million packaging costs during the past year. Further cost reductions will be made when sufficient time has elapsed to prove that proposed packaging specification changes will not reduce the effectiveness of the packaging material. All packaging cost reductions must be weighed carefully to be sure we are not "penny wise and pound foolish". In our attempt to reduce packaging costs we must not overlook the prime need for quality materials capable of doing the job intended.

*Based on a paper presented at American Management Association Packaging Conference.

In 1956 there were two general increases in the cost of packaging materials. For instance,

Tinplate — Price increased 40c Base Box on April 30, 1956, and 10c Base Box on October 31, 1956.

Purchased Tins — Price increased 3% on May 1, 1956, and 3.7% on November 1, 1956.

Bottle & Jar Caps — Price increased 5% on January 1, 1956, and 5% on January 1, 1957.

Glass Bottles & Jars — Price increased 5% on January 1, 1956, and 7% on November 1, 1956.

Paper Shipping Cartons — Price increased 3½% on May 1, 1956, and 2% on October 1, 1956.

Bottle & Can Labels — Price increased 5% on May 1, 1956.

In an effort to combat such rising costs it is necessary that we search for every possibility, and then explore it carefully. Such has been our approach to the problem. I would like to discuss now a few of the most recent examples of packaging cost reductions within our company. In so doing we hope to illustrate what can be done to pull down the rising curve. At the same time we realize we have only "scratched the surface".

Reduced Size Closure

Our first example is the conversion of a 58 mm vacuum closure to a 55 mm closure. By the simple reduction of 3 mm in the diameter of the closure we were able to realize a savings of 5% in the cost of the closures. This same principle of closure size reduction can be applied to various other containers provided that it does not jeopardize the utility of the container, reduce the utility of the container, or reduce filling line efficiency.

Liner Specifications

Next is the cost reduction which developed from a change in liner specifications for our gallon vinegar case. Formerly we used a double corrugated liner which has been changed to a double-faced single corrugation, resulting in a savings of 9%. Repeated tests were necessary to prove that the double faced liner is adequate to give the glass container the necessary protection during shipment and handling.

Plastic Pickle Bags

This packaging cost reduction example involves a change from a laminated cellophane polyethylene to an extruded cellophane polyethylene. By a change in packaging material method of manufacture the supplier was able to develop savings up to 25% which were passed on to us. Since this change we have found it necessary to increase the weight of polyethylene so as to give us adequate protection during shipment. Although this has reduced our savings we still have been able to enjoy a substantial amount of money on an annual basis.

KARL F. LANG

Case Paper Reduction

By changing from a regular slotted case to an end opening case for precooked cereal we are able to take advantage of appreciable reduction in paper with a resultant 19% savings. This same principle will be applied to other cases which will result in additional savings.

Tin Coating Specifications

Until recently we used 1.25 hot dipped tinplate bodies for Baked Beans, Spaghetti and Macaroni products. By changing our specifications to 1.00/.25 differential coated plate, we were able to reduce the packaging costs by 7%. In so doing we have a more uniform tin coating in contact with the food product.

Reduced Basis Weight

Following repeated experimental production runs we were able to show that 80# basis weight plate was adequate in place of 85# basis weight tinplate. Further experimental production revealed that 75# basis weight tinplate was sufficient to do the job for certain size containers. In making this further reduction we realized a savings of 1.6%.

Closure Specifications

One of our major anticipated packaging cost reduction projects involves a change from one type of screw on closure to another type of screw on closure. With 6 months of limited commercial experience we have found that the suggested closure is doing a very satisfactory job. Furthermore, our manufacturing group is quite pleased with the capping operation. By this simple change in style of closure we will save 42% of the present cost of closures for a particular large volume variety.

Reduced Test Cases

Following the completion of a series of cooperative tests with our Transportation and Warehousing Division we were able to conclude that 175# test cases were adequate in place of 200# test cases for certain weight bracket varieties. By reducing the cases to 175# we still conform to Rule 41 of the Freight Classification Regulation and at the same time realize a savings of 5%.

Reduced Lithographing Colors

Our 5½-oz juice tins were formerly lithographed outside with 6 prints on metal. Following a study by our Product Development group, it was found that 2 prints on a white coat system give a desirable appearing container. By the elimination of several printings we were able to show a savings of 3.5%. Through such a packaging specification change we were able to improve the appearance of the container and at the same time save a considerable amount of money on an annual basis.

Reduced Size Label

Small packaging material changes sometimes appear insignificant, but when multiplied on large volume items can show an appreciable savings. Such is the case of wraparound labels used on many of our glass and tin containers. With the minute reduction of only ⅛" in length per label we were able to realize considerable savings. Depending on the size of the label, we have made reductions from ⅛ to ¼", resulting in savings of .4 to 3c/1000.

Reduced Enamel System

Recently we concluded a study of closures used for glass containers involving a one coat versus a two coat inside enamel system. Through extended tests by both our supplier and ourselves it has been shown that a one coat enamel system for the inside of these particular closures showed promise with regard to retention of product quality as well as anticipated shelf life. By changing the specifications to a one coat system we will realize a savings of 2.5% over the present cost of closures. For the volume used on an annual basis we will save an unbelievable amount of money.

Reduced Tinplate Size

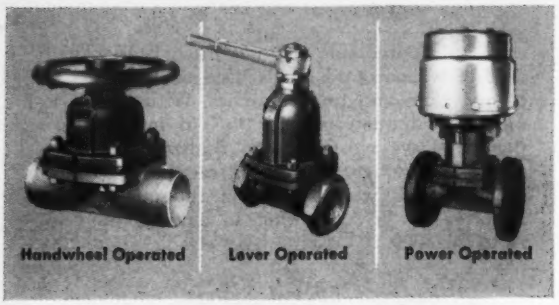
Through continued efforts on the part of our Can Making Department we have been able to reduce the ordered tinplate size used for certain tin container manufacturing. Small reductions of 1/16" or more on a side have resulted in fantastic savings in the purchase of tinplate. For example, one order size has been reduced from 28⅛ x 32¾, to 27⅞ x 32-1/16. This reduced size alone will result in a 3% saving over the initial dimensions.

Lightweighting of Glass

The Packaging Development Laboratory is continuing in its effort to reduce the weight of glass used per container without jeopardizing its performance through increased breakage at the time of filling or subsequent shipping. On a large volume item such as our 14-oz Ketchup bottle we can realize large savings in freight alone by removing a very small amount of glass per bottle. For example, a reduction of 1 oz of glass per 14 oz Ketchup bottle will mean a total savings by the glass container manufacturer of 750,000 lb of glass for every million dozen jars filled per year.

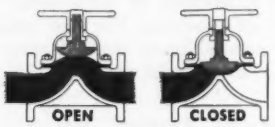
Redesigning of Containers

Work at present is under way in redesigning our 11-oz pickle container in the hope that it will result in a more attractive container using less glass as well as a reduced size closure. In place of the 70 mm closure we will use a 63 mm closure.



ALL-PURPOSE VALVE

In industries as varied as mining, food, textile, pulp and paper, beverage, water and sewage, chemicals . . . Grinnell-Saunders Diaphragm Valves continue to win enthusiastic acceptance. This valve is unsurpassed for handling such diversified products as corrosive fluids, gases, viscous materials, foods, compressed air, and solids in suspension. The design of the Grinnell-Saunders Diaphragm Valve is unique. The flexible, long-wearing diaphragm presses tight for positive closure.



Grinnell-Saunders Diaphragm Valves are available in a wide range of body and bonnet styles; also body, lining and diaphragm materials.

Choice of Materials

Bodies — iron; cast steel; stainless steel; Durimet 20; Hastelloy, A, B, C; bronze; Monel; aluminum; PVC (polyvinyl chloride); Saran

Body Linings — hard rubber; soft rubber; neoprene; glass; lead; plastics; Heresite; Lithcote

Diaphragms — soft natural rubber, natural rubber; white synthetic rubber; neoprene; reinforced neoprene; butyl; Hycar; Teflon; Kel-F; PVC (polyvinyl chloride); polyethylene

Bonnets — iron; stainless steel; bronze; other materials on special order

Choice of Bodies

Conventional weir type.

Straight bodies — screwed; flanged; socket weld; butt weld; socket (solder); sanitary threads; hose ends; Victaulic

Angle bodies — screwed; flanged; socket weld

Other types

A line of Straightway Valves (for straight-thru flow) and Full-Bore Valves (for ball brush cleaning) also are available.

Choice of Bonnets

Handwheel (non-indicating stem, indicating stem); chain wheel; lever (for quick operation); sliding stem (for a wide selection of power operated topworks)

Write Grinnell for further information.

Grinnell-Saunders Diaphragm Valve

Grinnell Company, Inc.
Executive Offices: Providence, R. I.
Sales Offices and Warehouses in Principal Cities

When inquiring check 8194 opposite last page

Insufficient evidence

to recommend any basic changes in diet of the average healthy American . . . is summary comment of Dr. Grace Goldsmith at recent symposium on fats and nutrition of American Oil Chemists

The American Oil Chemists had Dr. Grace Goldsmith of Tulane University Medical School as the final speaker at their recent symposium on fats and nutrition. Dr. Goldsmith is Professor of Medicine at Tulane, and also serves on the Nutrition Foundation's Scientific Advisory Committee and on the National Research Council's Food and Nutrition Board. Her assignment was to make a summation of the reports presented at the symposium. Some of her comments which are thought to be of special interest to our readers follow:

"Although many metabolic studies show a casual relationship between dietary fat and blood serum cholesterol and other lipids, it does not necessarily follow that there is a relationship between serum cholesterol and atherosclerosis. Even if such a relationship is demonstrated, it remains to be shown that coronary artery disease with heart damage from vessel closure is related to the intake of dietary fat. Only recently have investigations been able to produce occlusion of coronary arteries with damage to heart muscle, in experimental animals.

"The association of elevated serum lipids with atherosclerosis may not be one of cause and effect but may rather be related to some other common cause. It should be emphasized that atherosclerosis is in all likelihood the resultant of a number of factors — some operating locally in the vessel, others systemically through the blood stream and nervous system. Heredity, mechanical factors such as blood pressure, anatomy of the arterial wall, hormones, serum lipids and dietary factors including substances other than fat, may all be involved.

"In our present stage of knowledge, with many hypotheses and few established facts, it is unfortunate that so much speculation and opinion has appeared in the lay press. It seems obvious that to date there is insufficient evidence to recommend any basic change in the diet of the average healthy American. We do not yet know the kinds and amounts of fat which are desirable for good nutrition.

"A diet containing adequate amounts of all known essential nutrients and furnishing only enough calories to maintain normal weight should be recommended now as in the past. For persons with coronary artery disease or with a strong familiar tendency to this disease, or for persons with elevated serum lipid levels, the physician may wish to prescribe some change in dietary fat intake as an experimental procedure — to be carefully followed and evaluated.

"Finally, in spite of the paucity of current knowledge, there is sufficient evidence which suggests that dietary fat and serum lipid levels may be implicated in the development of atherosclerosis and coronary heart disease to justify intensive exploration of all facets of this and related fields. Information obtained from this research should prove valuable in understanding the role of fats in human nutrition, irrespective of findings relative to the atherosclerosis problem."

Undesirable toxic polymers of fats not found in commercial frying

reports Dr. Daniel Melnick, Chief Technologist, Best Foods, Inc., at the Oil Chemists meeting

Dr. Melnick summarized the results of a survey of the Potato Chip Industry covering operations by 89 chippers using all types of frying oils and fats. The oils in use on a continuing commercial basis were found to be free of undesirable polymers.

This conclusion was supported by the similarity in physical properties and in chemical composition between the fresh and heated oil in each commercial opera-

tion. In degree of unsaturation of the oils, melting point, setting point, fatty acid composition, increase in free fatty acids, development of fatty acid isomers, solids content index, and in crystallizing properties of the oils, there was no difference between fresh and heated oil of such magnitude to warrant criticisms of the wholesomeness and nutritive value of the oil absorbed by the chip.

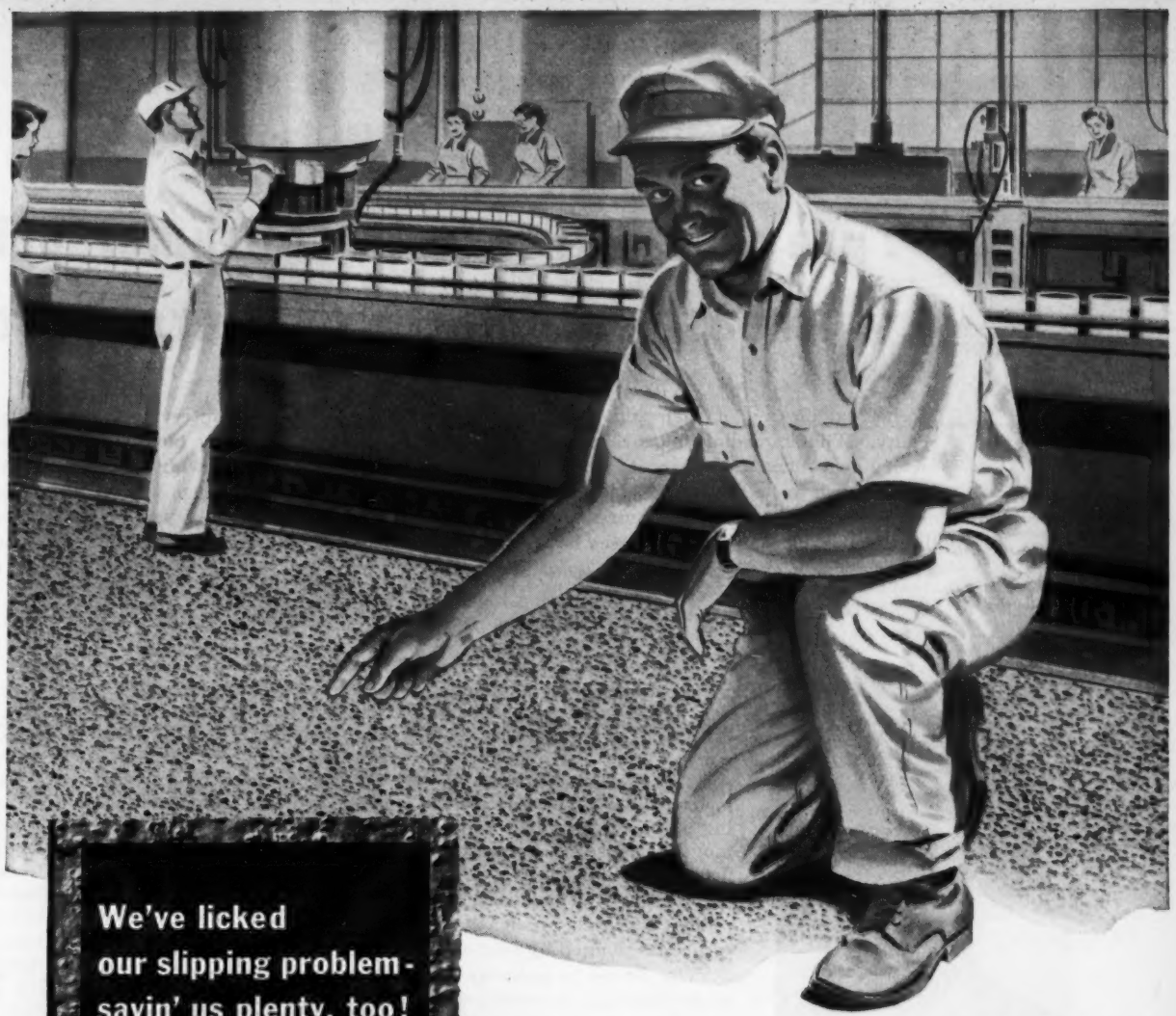
Undesirable polymers can be produced in frying oils when these oils are subjected to drastic heat and oxidation treatments. However, temperatures of 527°F used in "unrealistic" laboratory experiments were 100°F above the smoke point of the frying oils and are not encountered in the frying industries.

Commercial frying operations are conducted under a blanket of an inert atmosphere — the steam generated by the food being cooked — and is not subjected to constant aeration. Another consideration is that the oil is constantly replenished with fresh oil.

★ ★ ★

Views of 18 authorities

Terse commentaries of eighteen authorities on recent developments in fats have been combined into a 12-page reprint (convenient size of 8½" by 11"). Their views first appeared in the January, March, and April issues of FOOD PROCESSING. To secure one of these reprints send 50c to The Editor, FOOD PROCESSING, 111 East Delaware Place, Chicago 11, Illinois. Quantity prices on request.



He's talking about ALGRIP—A.W. ALGRIP—the world's only abrasive rolled steel floor plate that provides super-safe footing under the *most hazardous* slipping conditions—on flat *or inclined* surfaces.

ALGRIP licks slipping and skidding hazards thoroughly by providing thousands of abrasive traction particles at every step. It's made by a patented process in which a grinding-wheel type of abrasive is rolled—*not coated*—to a controlled depth as an integral part of tough steel plate. Usage merely exposes more abrasive.

Look around for slipping hazards and make a test installation in your worst area. It'll save you plenty, too, as accident and insurance rates go down. Use it as an overlay or as independent flooring. ALGRIP fabricates easily and requires no maintenance.

ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALGRIP—*approved for safety by Underwriters' Laboratories*

OTHER PRODUCTS:
A.W. SUPER-DIAMOND economy rolled steel floor plate—Plates—Hot and cold rolled sheet and strip—(Alloy and Special Grades)

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Conshohocken, Pa.

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Company_____

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Predict snap bean harvester will . . .

• prevent increase in consumer prices
• increase income to growers, processors

Mechanical picking of snap and wax beans is a reality. What immediate improvements in field and factory operations are apparent? Does a new bean variety have to be developed? Is additional acreage needed to produce the required tonnage? Are there noticeable quality differences between hand and machine-picked pods? These questions were asked in special interviews with industry leaders . . . men who have closely followed and fostered automation in growing, harvesting, and handling raw products to be processed in food plants. Following are the thoughts of four processors, one grower, and one agricultural scientist based on their observations as well as practical experience.

MORTON ADAMS

May Require Twice as Much Bean Acreage

Morton Adams,
Executive Vice President
Alton Canning Co., Inc.
Alton, N.Y.

Without the harvester, snap beans grown in New York State would not be able to compete price wise with beans grown in other areas. Alton Canning has worked with the harvester since the first experimental model was developed in 1948. This year we are so confident in its ability that about one-half our acreage will be machine-harvested.

Operational savings include: field trucks with beans in 600 lb pallet boxes system; one man driving lift truck with rotating head on lift mast unloads into large box on receiving platform; conveyor in box moves beans as needed to production line.

In order to insure maximum inplant operating efficiency, all beans are planted by heat-unit system. There is a bonus for early planting, so some growers start planting the latter

Number of acres planted each day is calculated to provide a harvesting tonnage to keep factory operating 18 hr/day. Since there are no second pickings, Alton in many cases requires twice as much acreage for each harvest day than under hand-picking system.

Another measure to insure maximum daily tonnage is counting bean plants per row. Alton's fieldmen have found that five plants per foot yields an average of 800 to 1200 lb/acre more than spacings further apart. Alton acreage is seeded to produce from 8 to 10 plants ft/row.

Under hand-picking set-up, a migrant labor force of 600 to 800 persons daily were needed to pick. This season the staff to recruit and handle this picking labor has been reduced more than 50%.

All harvesters are initially bought from its manufacturer by Alton; large acreage growers pay them off through a tonnage harvesting system; other growers purchase them through their cooperative loaning agency, Production Credit Corp.

President Naeye (right) and son, Don (center) of Marion Canning Co., explain some legal regulations on hiring seasonal field labor to Assistant Editor Nordlinger

Abandoning All Field Labor Camps

Peter J. Naeye, President
Don Naeye, Raw Product Procurement
Marion Canning Co.
Marion, New York

This year growers will receive more for their harvested beans, yet housewives will not have to spend more for their purchases of Marion processed snap and wax beans. The big factor is the successful development of the mechanical bean harvester.

This machine should not cause an unemployment problem. Unskilled seasonal field labor has been more difficult to secure each year. For 20 years Marion Canning was able to recruit a picking crew from the immediate region — many pickers coming as family groups. But today conditions have changed . . . jobs in factories and mines are much more plentiful, if not, most states are willing to provide an "unemployment" check . . . state laws on driving and insurance coverage hinder this type of labor from coming to this area . . . more industry is being located in the areas where these people call "home" . . . and most recently, additions to federal social security laws do not promote the use of large groups of temporary migrant labor. Thus, this year we are abandoning all farm labor camps.

Marion Canning will pick fields only once, using a mechanical picker for each 150 acres. In-plant operational costs are expected to be lower because hand pickers included too many leaves and stems and seldom picked the small succulent beans which produce the top quality the modern housewife desires.

Snap bean grower, Don Cahoon, checking some of the new design features of the bean harvester with Harold Buckley of Chisholm-Ryder's technical service

$180 For Hand Picking vs. $40 For Machine

Donald Cahoon, Owner
Cahoon Farms, Wolcott, N.Y.

There's less cull material in machine-picked beans than these picked by hand and that means a more profitable undertaking. Machine picks the beans before they become too mature . . . thus processor secures better quality and grower may possibly save an entire field. Second pickings by field labor contains too many left over beans (culls), missed from the first picking.

Cahoon Farms is in the apple growing and processing business. Growing beans for the caners was a profitable sideline until a few years ago when picking labor became too expensive and too difficult to secure. The mechanical picker has showed there is profit in growing beans. Hand-picking produced about 3 tons/acre, costs a minimum of $60/ton to harvest; machine-picking produces about two tons/acre and costs $20/ton.

The apple orchard business is handled 100% on pallets or in bin pallets. Bean picking was using bags because that's the way processors specified. This season our processor has gone 100% to bin pallets. Thus further savings can be expected since the Farms have all the equipment to handle beans in bin pallets.

(Turn to next page)

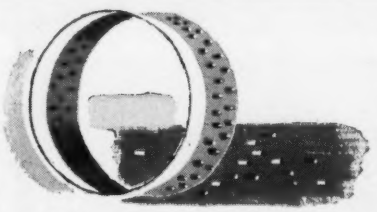
Q. What's the best way to store and handle these bulk materials?

1. MEAL — alfalfa, meat, soya, corn, barley and other grain meals.

2. WOOD PRODUCTS — chips, flour, sawdust, shavings and cork.

3. EDIBLE PRODUCTS — flour, sugar, starch, malted milk powder, malted barley, dried milk, popcorn and other whole grains.

4. CHEMICAL COMPOUNDS — insecticide powders, pharmaceuticals, urea, ground rubber, clays.



5. PELLETIZED MATERIALS — alfalfa, urea, oil meals, nitrates and other chemicals.

ILLUSTRATED HERE are a few of the many bulk materials that can be stored and handled by Permaglas Storage Units. Variety of products and industries served is practically unlimited. If you have a storage and handling problem, we will be glad to discuss its solution with you.

A. Mechanize the job completely with A. O. Smith Permaglas® Storage Units

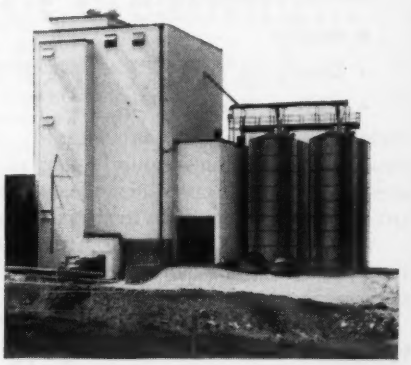
WHATEVER your bulk materials storage and handling problems, it will pay you to investigate A. O. Smith Permaglas Storage Units. A modern materials handling system incorporating these units lets you *store more in less space . . . at lower cost.*

● **Greater overall efficiency** — Incoming materials are conveyed directly into the Permaglas Storage Unit. Exclusive sweep-arm bottom unloader automatically discharges bulk materials into your apportioning system — by the batch or in continuous process.

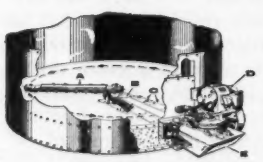
● **Reduced materials handling costs** — Permaglas Storage Unit is designed for maximum filling. Permits economical bulk-lot materials purchasing. Eliminates costly man-handling of incoming packages as well as in-plant trucking.

● **Maximum use of space** — Variety of heights and diameters available in Permaglas Storage Units assures maximum use of storage space in existing locations or new facilities.

● **Minimum maintenance costs** — Permaglas Storage Units are glass-protected steel, inside and out. No internal corrosion from stored materials. No expensive exterior maintenance as with conventional structures.



The Permaglas Storage Unit installation, with mechanized sweep-arm bottom unloaders, is the heart of this modern bulk materials handling system.



OPERATING PRINCIPLE OF A. O. SMITH SWEEP-ARM BOTTOM UNLOADER. As unloading arm (A) moves counter-clockwise, endless chain on arm moves the material to the center where it drops into sub-floor conveyor trough (B) for removal at discharge opening (E). Two steel plates (C) cover chain conveyor. Entire mechanism is powered by electric motor (D).

Through research 10 *... a better way*

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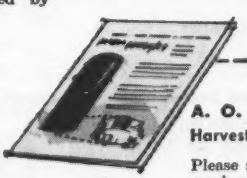


Mail coupon for 6-page bulletin on Permaglas Storage Units with mechanized bottom unloader.

A. O. SMITH CORPORATION
Harvestore Products, Kankakee, Ill., Dept. FP-657

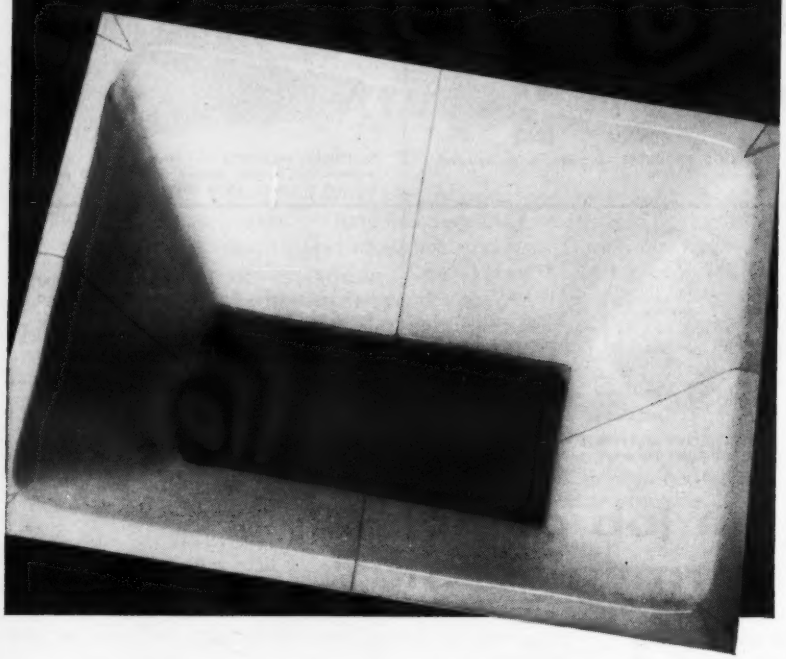
Please send me more information and data about Permaglas Mechanized Storage Units.

Name.....
Firm.....
Address.....
City.....Zone.....State.....

MU-2333

When inquiring check 8197 opposite last page

Cementable TEFLON solves sticky food-handling problems



Slipperiest material provides non-stick sanitary surfaces for . . .

- Hoppers
- Chutes
- Conveyor guides
- Packaging machine guides
- Filling machines
- Work tables
- Confectionery molds
- Baking pans
- Pastry flats
- Mixers
- Feeders
- Bins, etc.

Lining hoppers, chutes, feeders, bins—slippery TEFLON* reduces surface friction. Dry powders and other materials flow freely. Eliminate need for vibrators or manual attention.

On guide rails of conveyors and packaging machines—food products are not damaged, packages are unmarred, no "jam-up" occurs.

On work surfaces—clean up time is reduced to a minimum and sanitation is greatly improved.

As coverings for candy bar frames, cookie flats, bakery rolls, proving pans—sticky products "come clean" without assistance.

Find out about this slipperiest of all solid materials that is also chemically inert, non-contaminating, tasteless, odorless, has zero water absorption.

Made in inexpensive tape in continuous rolls and in sheets up to 48" x 48" in size.

Readily cemented with commercial adhesives to any metal, wood, concrete, plastic, glass or other surface of new or existing equipment.

Write for Bulletin AD-158.

*du Pont trademark

United States Gasket Company
Camden 1, New Jersey

United States Gasket *Plastics Division*
OF THE GARLOCK PACKING COMPANY

When inquiring check 8198 opposite last page

Snap bean harvester

(Continued from preceding page)

Few if any snap bean pods remain on the picked rows in the foreground. Machine is operating in experimental field, where beans have been seeded 2" in the row, thus pods are high. In other rows where seeds were planted 6" apart pods tended to be on the ground

"Revolutionizes" Bean Growing

Mark Mitchell
Manager Raw Products
Larry Polzak
Head Fieldman
The Larson Company,
Green Bay, Wis.

Now that there is a practical mechanical harvester, snap beans need no longer be considered a specialized crop — to be handled on small acreage by a family group. It rates with the "big crops" such as corn or peas and could even displace a field crop in the rotation. It is a machine-handled crop from seeding until it enters the processing line.

Russ Winters, president of The Larsen Company, has encouraged this development as a means to improve grower's income, provide a more stable bean tonnage, and prevent undue yearly price fluctuations on the retail market.

For a number of years, Larsen's carrots have been completely mechanized from seeding to processing. Now attention will be devoted to peas — a compact mobile combine is needed to avoid removing pods and leaves from the field, when only the pea is wanted.

This year Larsen is planting beans in big fields as large as 350 acres, thus requiring only 10% of the growers previously contracted.

Larsen will be using 16 mechanical harvesters, each picking about 200 acres. Harvesting costs are expected to be lowered to 1c/lb. Beans have been planted on schedules (heat unit system) just as peas and corn. Since the 1957 model harvester has been modified, breakage of beans during harvesting is expected to be materially reduced.

Present Varieties Suitable

Dr. John D. Atkin, Assistant Professor of Vegetable Crops
New York Experiment Station
Geneva, N. Y.

New varieties of snap and wax beans are *not* needed in order for the improved model of the mechanical harvester to work effectively. The machine was tested experimentally by Prof. W. T. Tapley in 1952.

Last season it was again tested and in experimental trials up to 90% of the pods of certain varieties were picked. These beans were practically free of leaves and twigs, and with very little bruising of the pods.

The machine picked as high as 90% of the pods of varieties with vine types similar to Tendergreen and Slendergreen. However, only about 80% of the pods of the varieties Seminole and Topmost could be picked.

From the initial year's test data, very close spacing (1½ to 2") in the row produces plants better adapted to mechanical picking. Under close spacing, plants develop a single upright stalk with very few branches. The height of the first node from the ground is greater, the length of the main stem is longer and there are less low branches. All factors considered indicate that close spacing would give a better vine for mechanical harvesting.

10 Acres is Minimum Field Size

Ray Lapinski, Field Manager
Jerome Krier, Production Manager
Krier Preserving Co.
Belgium, Wis.

Krier Preserving has contracts with half the number of growers than previous years, yet will process more top quality snap and wax beans. About 75% of the bean acreage will be on leased or company-owned land within one mile of Belgium. The remaining acreage will be in 10 acre or larger fields (last year the minimum was 5 acres).

Large fields with long rows foster better farming practices, use of up-to-date field equipment, careful control of fertilizer placement, and ready use of such materials as pre-emergence weed sprays.

Mechanical pickers will load directly into wagons holding about two tons of beans and pulled by a tractor. Seven harvesters are calculated to easily pick Krier's large bean acreage.

(Mechanical Bean Harvester is a development of Chisholm-Ryder Co., Inc., Dept. FP, 5380 Highland Ave., Niagara Falls, N.Y. . . . or for more information check 8196 on form opposite last page.)

When you count the cost of cleaning... Which squeezers really cost more?

Crucible stainless steel is easier to clean, more resistant to corrosion, never chips, peels, or contaminates food

The speed at which food must be processed today means there is literally no time for slow, difficult cleaning of equipment. There's no time for replacing worn, rusted, or corroded equipment either. It's by saving time here that Crucible stainless has made its impact on today's swiftly-moving food processing industry. Crucible stainless is not only the fastest material to clean in the business, it easily withstands harsh cleaning chemicals that speed up the process but often attack other metals.

Crucible stainless always comes clean without developing rough spots that collect bacteria. No foods—no matter what corrosive acids they contain—can break down its smooth, shiny surface. The story is the same even for harsh processing liquors—no chipping, no peeling, no dissolving—so Crucible stainless never affects either flavor or appearance of food, and never takes any flavor away either.

In the long run, the more equipment you have made of Crucible stainless steel, the less you'll pay to process food.

To get all sides of the Crucible stainless story, take either of these simple steps: (1) write for free 40-page bulletin discussing the use of Stainless Steels in the Food Processing Industry, or (2) contact *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor—Railway & Power Engineering Corp., Ltd.

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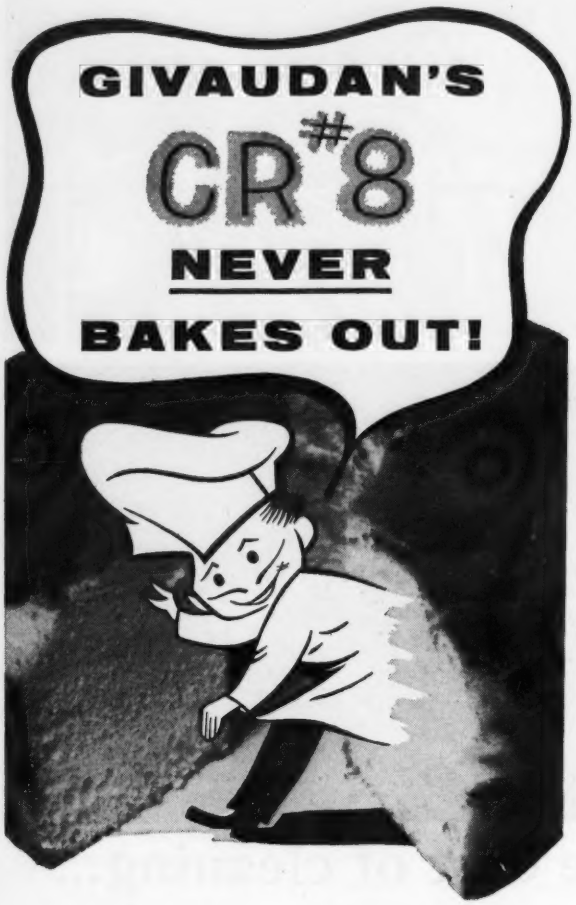
A complementary additive to vanilla flavors...



Baked products faithfully retain their vanilla odor, taste and flavor strength when Givaudan's C. R. #8 is used as a fixative. Its resistance to high as well as low temperatures has been *proved in actual use* by the baking, candy and ice-cream industries. C. R. #8 is soluble in alcohol and propylene glycol. C. R. #12 —a variation of C. R. #8—is also soluble in vegetable oil. Both are coumarin-free.

C. R. #8 is only one of Givaudan's *proved-in-use* products. You can rely on Givaudan for custom-made or standard flavors that *always* meet your requirements. Samples and literature on request.

Givaudan Flavors Inc.

330 West 42nd Street, New York 36, N. Y.

When inquiring check 8200 opposite last page

Stabilizes Imitation Vanilla

Retains full strength 50 days at 113°F sealed in soluble gum membrane

DR. GEORGES WELLNER
Alva Flavors Division
van Ameringen-Haebler, Inc.

Maintaining optimum quality and level of imitation vanilla or vanillin flavor in prepared and packaged foods — a perennial processing problem — is particularly important considering the tremendous increase in popularity of dry mixes (so-called "convenience" foods).

The rapidity with which vanillin deteriorates in dry mixes has been cited in reports on a substantial body of research. Bruska, for example, detailed experiments (Roczhik Panstwowego Zakladv Higieny 1, 1950, No. 2) which established that vanillin-sugar mixtures are subject to these sublimation losses under store shelf conditions:

after 3 months — 10.9%
after 6 months — 31.5%
after 10 months — 56.4%

Chart 1 presents the findings in detail.

When the samples were maintained at 82°F in an oven, vanillin losses increased to 37% after 6 months and 67.9% after 10 months. The researchers also reported that (a) losses generally are greater from a fine crystalline sugar mixture than from a powder; (b) higher temperatures accelerate losses.

Stable dry vanilla needed

Similar observations made in our own laboratories pointed up the need for a

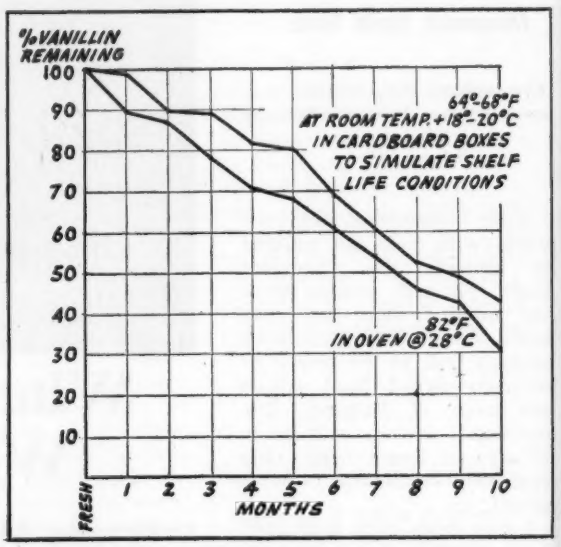


Chart 1. Shows losses of vanillin in vanillin-sugars mixture (100 kg powdered sugar—1200 gm crystalline vanillin)

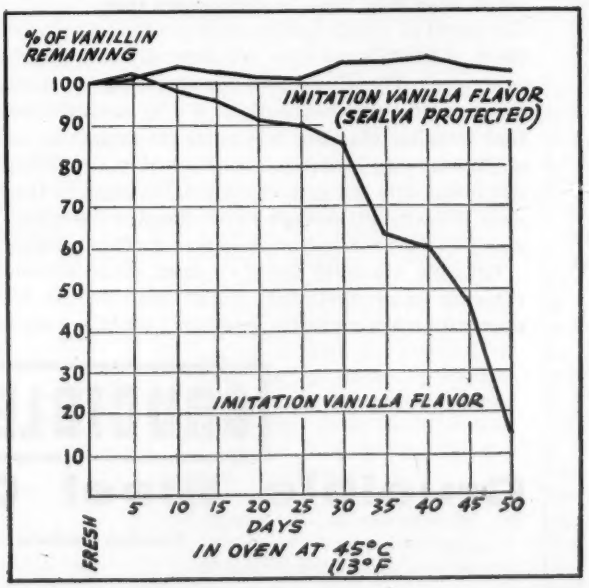


Chart 2. Shows percentage of total aldehyde present calculated vanillin in imitation vanilla flavor in sealed-in form vs. same flavor not so protected

stable imitation vanilla flavor for dry mixes. Initiating a concerted effort, we found the answer right at hand. We had previously developed, and utilized on a commercial basis, a method by which microscopic globules of flavor are hermetically sealed in a soluble gum membrane to yield a dry powder which can be used as a flavorant in dry mixtures. A similar technique applied to a standard imitation vanilla flavor produced gratifying results.

Quick-aging tests were utilized to compare this processed vanilla flavor with identical, but unprotected vanilla flavor (a simple mixture of the ingredients of the vanilla flavor (such as vanillin, ethyl vanillin, etc.) with the same vegetable gums used for the sealed-in sample and in the same proportions.)

Measured quantities of both samples were placed in open dish type containers and kept in an oven maintained at 113°F over a 50-day period. Samples were analyzed every 3 days to ascertain losses. Analytical results are shown in Chart 2.

Unprotected samples deteriorate

It is significant that the protected imitation vanilla flavor was maintained at original optimum level for the entire 50-day oven treatment. The unprotected sample was subject to these substantial losses:

after 15 days — 5%
after 30 days — 15%
after 45 days — 44%
after 50 days — 80%

Chart 2 definitely confirms previous scientific findings of high flavor losses with ordinary vanillin sugars, and reveals that a parallel condition exists with standard imitation vanilla flavor. Moreover, it establishes the stability of the gum-encapsulated vanilla flavor.

It might be noted, incidentally, that the flavor content of the gum-protected flavorant slightly exceeded 100% after 5 days of oven treat-

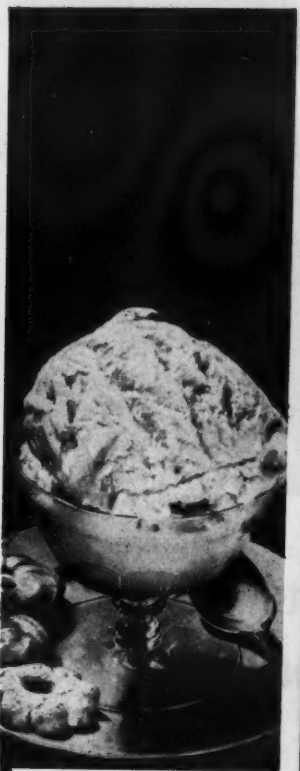
(*Turn to next page*)

IN BREAD

Assures complete, controlled fermentation, enhances flavor and aroma, gives even texture, uniform grain, maximum retention of softness, longer shelf life.

IN CATSUP

Preserves piquant tomato flavor, enhances delicate spice flavors, protects the rich red color of all tomato products.



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Assures firmer, finer-grained ice cream, with rich butterfat flavor—prevents surface crusting and preserves true fruit flavor in sherbets and water ices.

IN CANNED FRUITS

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CERELOSE

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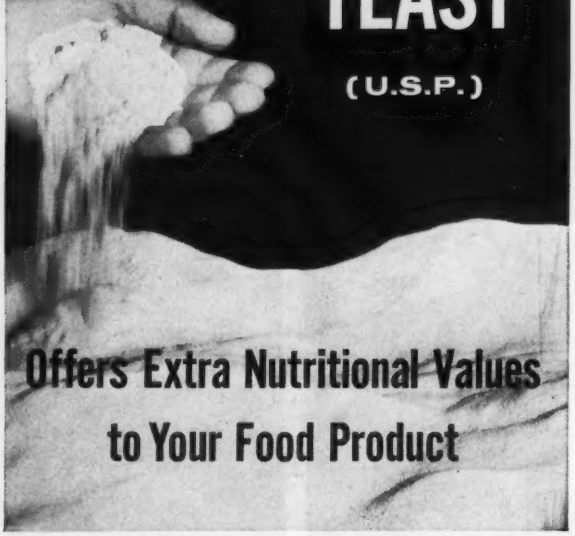
For technical assistance in developing improved food processing formulations, contact our nearest sales office or write:

CORN PRODUCTS SALES COMPANY, 17 BATTERY PLACE, NEW YORK 4, NEW YORK

When inquiring check 8201 opposite last page

DRIED TORULA YEAST

(U.S.P.)



Offers Extra Nutritional Values to Your Food Product

TYPE	THIAMINE	RIBOFLAVIN	NIACIN	PROTEIN
B	0.15 mg./g.	0.05 mg./g.	0.5 mg./g.	50%
50	0.15 mg./g.	0.10 mg./g.	1.0 mg./g.	50%
90	0.27 mg./g.	0.10 mg./g.	1.0 mg./g.	50%
200	0.60 mg./g.	0.10 mg./g.	1.0 mg./g.	50%
300	0.90 mg./g.	0.10 mg./g.	1.0 mg./g.	50%

The above potency values are in milligrams per gram.

Torula food yeast is primary grown and controlled to meet and exceed the minimum U.S.P. XV quality standards for dried yeast.

The advantages of Torula Yeast are high levels of B-Complex factors, high protein level of excellent quality, mild taste, stability, uniformity and high purity.

The low cost of this remarkable nutritional ingredient offers many possibilities for improving good products in the food and pharmaceutical fields.

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Charles Bowman and Company
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600 S. Michigan Avenue
Chicago 5, Illinois
170 E. California Street
Pasadena 1, California

Lake States

Lake States Yeast Corporation • Rhinelander, Wisconsin
Subsidiary of Rhinelander Paper Company

When inquiring check 8202 opposite last page

ingredients

Stabilizes Vanilla

(*Continued from page 45*)

ment. This reflects the slight further dehydration of the "dry" mix in the oven.

This research was conducted on a standard formulation imitation vanilla. However, additional laboratory investigations we now have underway indicate this technique may just as effectively stabilize pure vanilla.

(Sealva Imitation Vanilla Flavor is a development of van Ameringen-Haebler, Inc., Dept. FP, 521 W. 57th St., New York 19, N.Y. Check 8203 opposite last page.)

Film shows plan to increase production, profits on breads, buns, rolls

Plan has been developed for use of a 16 mm film to promote discussion at staff clinics. The film covers every important phase of baking, ways to cut costs, increase

Demonstrator in film shows how to minimize stales

production, improve products, and a merchandising plan which the baker can use in his own market to increase consumption of bread products.

Among examples in the film which show means to increase profits are: how to cut sweetener handling costs as much as 96.2%; a natural, non-chemical way to keep bread moist and fresh 27% longer.

Baking Clinic film can be arranged through A. E. Staley Mfg. Co., Dept. FP, Decatur, Ill. When inquiring specify 8204 opposite last page.

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Keeps foods from sticking to your equipment—Speeds production. Non-toxic—safe to apply to all containers and equipment that come in contact with food.

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(Silver Springs, Md.)

When inquiring check 8207 opposite last page

Announce low bacteria whey powder

Dry sweet whey is being manufactured with low bacteria count. Exceeding US Extra Grade standards, the powder features minimum acidity and absence of gas forming microorganisms. Suggested uses are as dairy ingredient in refrigerated doughs and batters, cold packed cheese spreads, brew process bread, and gravies for frozen pot pies.

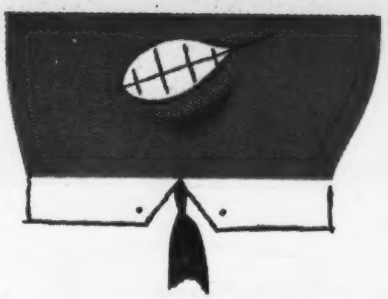
Sample of whey powder from Consolidated's new Galena, Ill., plant being examined by (l to r) Hal Young, gen. prod. mgr; J. H. Stewart, pres.; O. P. Gossett, bulk div. mgr.; Don Geiger, edible food sales

(Dry Sweet Whey is supplied on order with bacteria counts of less than 5000/gm from Consolidated Products Co., Dept. FP, 119 N. Washington Ave., Danville, Ill. . . . or for more information check 8208 which is located on form opposite last page.)

Finely ground BHT easier to use

Pocket-size folder emphasizes convenience and increased effectiveness of free flowing dry powder form of this antioxidant when used in feeds. It preserves vitamin E and helps birds to utilize it more efficiently. It cites approval of use of ¼ to ½ lb per ton of feed by FDA, BAI, and American Feed Control Officials.

Folder on new Micro-ground BHT is issued by Koppers Co., Chemical Div., Dept FP, Pittsburgh 19, Pa. When inquiring specify 8209 on form opposite last page.



The tale of an embarrassed Manufacturer

He shaved a tenth of a cent from his production cost. He did it by using an inferior flavor. He couldn't quite understand why his sales were so low . . his profit so small . . . his embarrassment so financial.

The moral is plain to see. Quality builds consumer acceptance . . . greater sales . . . more profit. Realize this goal with **P & S flavors.** Write for free samples.

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When inquiring check 8210 opposite last page

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

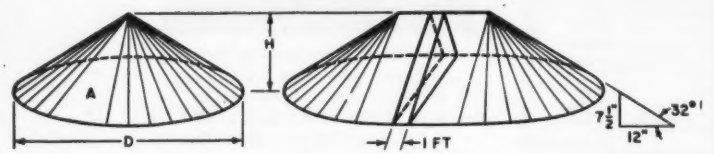
How to Determine Space Needs for Rock Salt Storage

Today, salt-using companies often have the problem of determining how much area and volume are needed to store a given amount of rock salt. To help the companies faced with this situation, International has developed a system for determining the exact floor space (or plant area) needed for any tonnage of salt. In addition, it is possible with this system to select the shape of salt pile best suited to individual plant layouts.

Principles of salt storage. International's system is based on two known facts: first, one cubic foot of rock salt (loosely poured and medium-packed) contains a constant average of 72 lbs. of salt. And, second, every conical pile formed by pouring rock salt from a fixed overhead point assumes the same shape.

Referring to the diagram, you will note that this shape is a perfectly conical one, with an angle of repose of 32° from the horizontal. In other words, for every 12-inch horizontal run, there is a 7½-inch rise. With these basic principles, therefore, it is possible to determine just how large a pile will be formed by any tonnage of rock salt.

Tables give complete area and volume data. For the convenience of salt-using companies, International has prepared a comprehensive set of tables with all the storage-space data for amounts of salt ranging from three to 23,000 tons. With these tables, for example, you can quickly find exactly the amount of space needed to store 3,000 tons of rock salt. (The answer is a single, conical pile 100 ft. in diameter at the base, and 31 ft. high.)



Diagrams of two basic rock-salt-storage piles. Conical at left, windrow at right. Note 32° bevel, which applies to both types.

DATA GIVEN IN INTERNATIONAL'S SALT-STORAGE TABLES

Given any amount of rock salt, from three to 23,000 tons, you can find these storage-pile measurements at a glance:

1. **Height.**
2. **Base Diameter.**
3. **Base Area.**
4. **Surface Area.**
5. **Volume.**

The same data apply to windrow segments. And because each measurement bears a fixed relation to every other, you can find every windrow measurement if you know just one.

In many plants, however, it is not possible to store salt in one large, conical pile. Instead, it must be stored in a lower, longer, windrow-shaped pile. In this case, International's computations on storage-space requirements apply equally well. The data in the tables permit you to select the height or length of windrow pile best suited to your plant needs.

Again taking the example of 3,000 tons of salt: It can be poured from a portable conveyor belt into a pile 65 ft. wide at the base, 20 ft. high, and 100 ft. along the crest. Or, if such a pile doesn't suit your plant needs, the same tonnage can be stored in a pile 75 ft. wide at the base, 23 ft. high, and 55 ft. along the crest.

Easy way to check tonnage of any salt pile. A problem often encountered by salt-using companies is how to determine the amount of salt in a given storage pile. Here again, International's complete tables will quickly give the answer. Because each measurement in a symmetrical salt pile bears a fixed relation to every other, it's possible to find every measurement when only one is known. Thus, a conical pile 16 ft. high will contain 368 tons of salt.

There is still another way in which International's salt-storage tables are helpful. If you want to cover an outdoor pile with tarpaulin or tar paper, you can easily find the surface area of the pile. For example: the surface area of a conical pile 45 ft. in diameter is 1,870 sq. ft. These comprehensive tables are included in a booklet, "Brine for Today's Industry," which will be sent to you at your request. Simply contact International.

TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like the assistance of an International "Salt Specialist" on any problem concerning salt or brine—or further information on space needs for rock salt storage—just contact your nearest International sales office.

International Salt Co., Scranton, Pa.

Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

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- ☐ Imitation Fruit Flavors
- ☐ Maple Flavor Specialties
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New container has heavy liner of polyethylene

Uses: Extends mold and rope-free life of bread and baked goods.

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Description: Sodium or calcium propionate is suitable for use in bread, cakes, pies, doughnuts, and buns.

When used in white bread, 2½ oz propionate per 100 lb of flour adds about two days to normal mold-free life. Slightly larger amounts increase the period proportionately. Figure cited is based on temperature of 85°F and 80% humidity.

(Improved "Mycoban" sodium or calcium propionate is a development of E. I. du Pont de Nemours & Co., Polychemicals, Dept. FP, Wilmington, Del. . . . or check 8213 on form opposite last page.)

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THE **1957**

GLYCERINE RESEARCH AWARDS

FIRST AWARD $1,000
SECOND AWARD 300
THIRD AWARD 200

These annual awards were established in 1952 to recognize research leading to new and improved applications of glycerine and glycerine derivatives. Award winning work may deal with the chemical, physical or physiological properties of these materials; with actual or projected uses; or with scientific principles likely to stimulate future applications. Originality in extending the usefulness of glycerine into new fields will receive special consideration.

BASIS OF ENTRY

These awards are open to any individual in the United States or Canada engaged in research, either in industry or with government or educational institutions. Entries by research teams of two or three associates are eligible. Persons connected with member companies of the Glycerine Division, Association of American Soap & Glycerine Producers, Inc., or laboratories which they employ are not eligible.

First consideration will be given to work which has come to a clear-cut point of accomplishment during the current year; but work carried on in previous years, the significance of which has been confirmed by commercial application in 1957, also will be eligible.

Entries will be judged by a committee of three persons of outstanding reputation and scientific background, having no connection with the Association or its members.

METHOD OF NOMINATION

Nominations must be made on the official entry blank, which may be obtained by writing to: Awards Committee, Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

All nominations for the 1957 awards must be received by November 1, 1957 to be eligible.

Honor Role of Glycerine Research Award Winners

1952

First	Dr. Ivan W. Brown, Jr. Duke University School of Medicine and Rev. Basile J. Luyet Institute of Biophysics, St. Louis University
Second	Dr. Raymond Reiser and Dr. Hermann Schlenk Texas Agricultural Experiment Station
Third	Research team at Southern Regional Research Laboratory headed by Dr. Reuben O. Feuge

1953

First	Dr. Erich Baer University of Toronto
Second	Dr. Lewis I. Gidez Brookhaven National Laboratory and Dr. Manfred L. Karnovsky Harvard Medical School
Third	Albert C. Nuessle Rohm & Haas and Russell F. Crawford, Jr. Sharon Hill, Pa.

1954

First	Prof. Robert K. Summerbell Northwestern University and Dr. James R. Stephens American Cyanamid Co.
Second	Two research teams: Dr. Robert W. Swick and Akira Kakao of Argonne National Laboratory and Dr. Harland G. Wood and Dr. Per Schambye of Western Reserve University
Third	Dr. Henry A. Sloviter University of Pennsylvania

1955

First	Dr. Reed A. Gray Merck & Co.
Second	Dr. Eugene P. Kennedy University of Chicago
Third	Dr. Karl H. Lauer University of Alabama

1956

First	Dr. Herbert J. Dutton U. S. Dept. of Agriculture
Second	Dr. Donald Zilversmit University of Tennessee
Third	Dr. Stanley G. Knight University of Wisconsin

When inquiring check 8215 opposite last page

ingredients

Stabilized icings extend shelf life of sweet goods

Resist melting in spite of heat, humidity

Features: Designed especially to produce a very white icing as well as one that will not become sticky or disappear regardless of heat and humidity. Icings made with this stabilizer are described as having lower specific gravity than many flat icings, providing more economical yet thorough coverage of baked products.

Description: Boiling type icing stabilizer especially suited for wrapped sweet goods. In powder form, it has long range keeping qualities. Packed in 250 lb drum with polyethylene liner.

(STA-PUT 95 is available from American Breddo Corp., Dept. FP, 601 W. 26th St., New York 1, N. Y. . . . or check 8216 on form opposite last page.)

Defoamer of vegetable origin available

Used in evaporators and carbonators

Features: Low-cost, low proportionate usage and absence of adverse effects in either the process or the processed sugar. Helps to keep evaporating and digesting equipment free of foams so that it can be operated close to rated capacity.

Description: Product is of vegetable origin and comes in liquid form. It can be added directly to carbonators, digesters, or evaporators.

(Defoamer F 42 is made by Swift & Co., Technical Products, Dept. FP, 1800 165th St., Hammond, Ind. . . . or check 8217 on form opp. last page.)

For more information on product at right, specify 8218 . . . see information request blank opposite last page.

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Consider the facts as tabulated below . . . that 7274 product requests were made by 2289 different industrial processing people last January, February, and March, using this handy form . . . many more than compiled by any other magazine in the field . . . more than half of these people coming from firms having a capital rating of over $1,000,000.

Titles	*Percentage of Individuals*
Companies: Owners, Partners, Presidents, Vice Presidents, and other corporate officers and executives	19.6%
Works Executives: Superintendents, Plant Managers, and Assistants	30.2%
Supervisors, Dept. Heads, Foremen, and Assistants	7.7%
Technical Directors, Directors of Research, Chief Chemists, Chemists, Food Technologists, and Assistants	22.5%
Engineers: Chief, Plant, Chemical, Process, Production, and Assistants	18.0%
TOTAL REQUESTS FROM INDUSTRIAL-PROCESSING PEOPLE	**100.0%**

In addition to the above requests, the following number were also made, by non-processing people; independent consultants and testing laboratories, 92; government: federal, state, municipal, military, naval, etc., 23; miscellaneous: librarians, etc., 90; titles not given, 82—bringing the grand total of requests to 2576.

By serving more of you key folks so that you actually profit by reading, FOOD PROCESSING has become your industry's favorite magazine. We appreciate your comments . . . we welcome your suggestions to serve you better.

THE EDITORS

Baby pigs deficient in digestive enzymes

Experiments on some 2846 baby pigs at Iowa State College indicate that baby pigs are deficient in a number of essential digestive enzymes, a fact which could influence baby pig starter feeds in the future. Both proteolytic and amylolytic enzyme systems were found to be incompletely developed in one-to-five week old pigs, who failed to grow properly on corn soya diets containing all known needed nutrients.

Response could not be explained on amino acid or any other basis, and enzyme deficiency was indicated. Feeding tests, with various enzymes as supplements, were inaugurated, and response to them was rather conclusive.

Oleoresin paprika from domestic pods

Standardized at 30,000 and 40,000 color units

Oleoresin Paprika, a new product, conforming in all respects to the requirements of the National Formulary is initially being standardized at 30,000 and 40,000 color units. Since it is extracted from California grown pods, its supply is not dependent on import.

(Oleoresin Paprika is available from Barnett Laboratories, Inc., Dept. FP, 6256 Cherry Ave., Long Beach 5, Calif. . . . or check 8219 on form opposite last page.)

THEY LOOK SO GOOD . . . the wonder is that any housewife can long resist the tempting food products displayed in today's exciting consumer advertising. Truth to tell, not many of them do . . . and so, this pictured promise of mouth-watering satisfaction *has to be fulfilled*. Ready to help the manufacturer meet this obligation is the supplier whose flavors ultimately determine the taste-character and quality of the finished goods. In choosing such supplier, remember that reputation, reliability and experience are your safest guides. Remember, too: *Your product is* ONLY *as good as its* FLAVOR!

If interested in special flavor applications — pie or cake filling, dessert powder, food or beverage — write our Flavor Division, Dept. FP.

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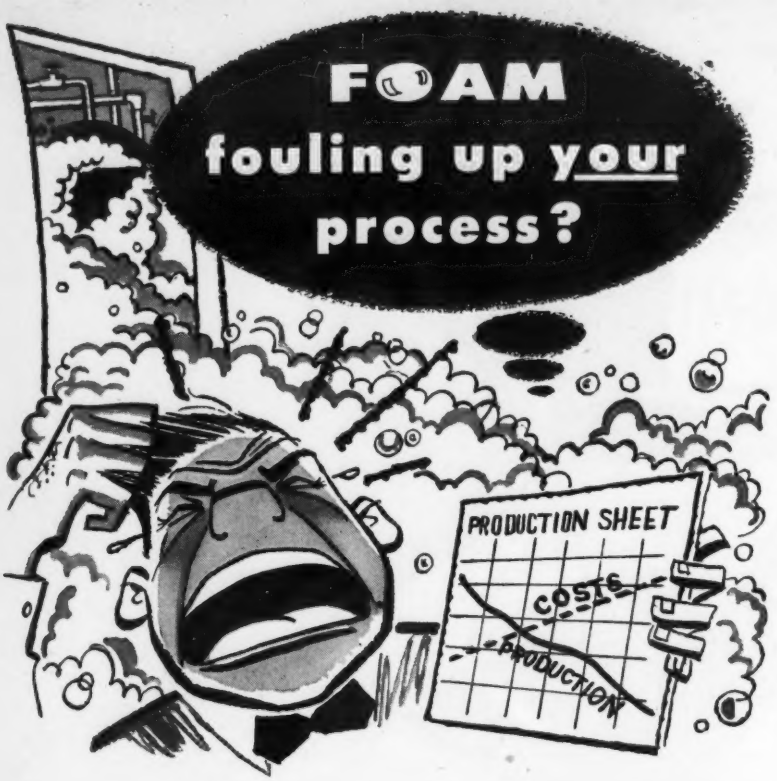
When inquiring check 8220 opposite last page

V1816 JUN 57 UMI



Get a Dow Corning Silicone Defoamer!

Now—solve your foaming problems immediately and at amazingly low cost with these Dow Corning silicone defoamers!

Antifoam A Compound—permissible to use in processing nonstandardized foods at concentrations up to 10 ppm.

Antifoam AF Emulsion (water dilutable)—permissible at concentrations up to 34 ppm.

A tiny amount can prevent mountains of foam . . . enabling you to utilize full productive capacity and put your processing into high gear. What's more, when you eliminate foam, you say goodbye to wasteful boil-overs and the fire hazards they may present.

. . . So, stop frothing about those FOAM problems—*eliminate* them with a Dow Corning silicone defoamer. They're the most versatile and efficient foam killers ever developed!

FREE SAMPLE and INFORMATION—

To receive a generous trial sample of a Dow Corning Silicone Defoamer, return coupon below or write on your letterhead. No obligation, of course.

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

5718

NAME

TITLE

COMPANY

CITY ZONE STATE

My foamer is

Oil system

Aqueous system

Food products

Other

When inquiring check 8221 opposite last page

Adding concentrate to jelly

retains natural grape flavor, cuts ingredient costs 39%

Red grape concentrate replaces more expensive Concord juice for flavoring preserves, soft drinks, frozen juices

A method for saving grape jelly makers 70% of their present heating costs; reducing their processing time per batch; retaining the same level of Concord flavor; and saving 39% or more on ingredient costs, is spelled out in a new booklet just off the press. A complete formula for accomplishing this feat is included in the easy-to-follow directions.

Key to all of these savings is use of concentrate made from red grapes to replace up to 75% of the more expensive Concord juice. The suggested formula is based on use of the red grape concentrate, plus single strength Concord juice on a 70-30 basis. This combination requires no "boiling down" to achieve the desired 62.5% solids, so all the Concord flavor essence is retained.

It was found in the laboratories of the concentrate manufacturer that the resulting "no boil" product matched in flavor level jelly made from 100% Concord juice.

Can be labeled pure jelly

The fuel savings and reduction in batch time result from using this no-boil method. By the time all ingredients are added, batch is ready for bottling. Resultant product can be labeled "Pure Grape Jelly" under FDA Standards (Feb. 1954).

Cost of concentrate, which is made of grapes from high yield Vinefera varieties, figures at around 36c/per gallon on single strength basis vs. around 80c/gal for Concord juice (figured at Los Angeles market). Comparative figures would vary according to freight rates to each locality.

Bottlers and frozen juice packers can also take advantage of price differential. Bottling may be done by simply adding water to produce a mild grape drink. By adding 25% or more of Concord juice, varying Concord flavor intensities can be achieved by the desired level.

How to prepare frozen juice

A pure frozen concentrate grape juice of 45° Brix can be made by blending approximately equal volumes of the red grape concentrate with single-strength Concord juice. Concord juice retains all its natural flavor, with no boiling, in same manner that frozen orange concentrate uses add-back juice.

Newly revised booklet also contains technical data on the

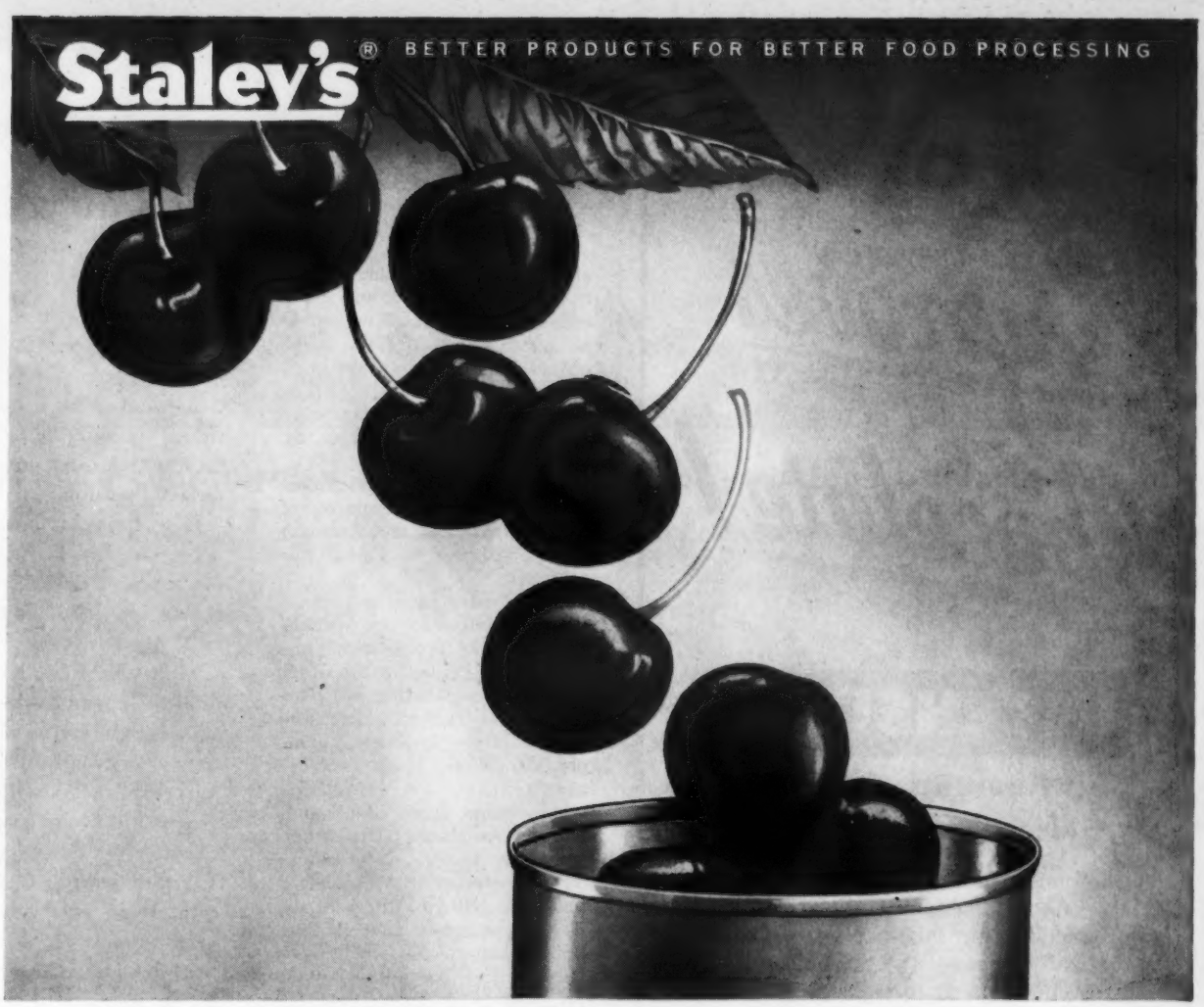
red grape concentrate, the computations by which savings are figured, instructions on application of product, and tables of use to jelly makers and bottlers.

Booklet, "Vie-Del Handbook for Preservers and Bottlers", 15 pages, is published by Vie-Del Grape Products Co., Dept. FP, 2808 East Nebraska Ave., Fresno 55, Calif. When inquiring specify 8222 on the convenient Reader Service slip opposite last page.

Describe ice cream, sherbet stabilizers in bulletins

In one bulletin, instructions are given for using an alginate stabilizer in either a hot or cold ice cream mix, and in ice cream powder. A separate bulletin describes recipes and methods of use for another alginate stabilizer for sherbets made with either ice cream or milk powder.

Protanal Ice Cream Stabilizer and Protabet Sherbet Stabilizer, 1-sheet bulletins, are available from Croda Inc., Dept. FP, 51 Madison Ave., New York 10, N.Y. When inquiring 8223 on the convenient Reader Service slip opposite last page.



Sure, low-cost way to lock in natural "fresh-picked" flavor and retain natural fruit colors

Staley's Sweetose Corn Syrup helps build brand appeal . . . boost repeat sales! How can you capture that succulent "just picked" flavor? How can you retain appetizing body after canning? How can you do away with the "browning" problem that can hex your brand and slow turnover? Sweetose, Staley's remarkable enzyme-converted corn syrup, can answer these questions and more . . . decisively and profitably for you.

Thanks to its unique characteristics, you'll find Sweetose is unequalled for upgrading the color quality of your brand. For Sweetose guards the natural pigments of your fruits. Retains the gloss and sheen that give your product that fresh-picked look.

From processing line to the table, discover the many ways Sweetose and the Staley automatic liquid sweetener handling system can trim your costs . . . improve quality . . . boost repeat sales. Call your Staley Representative at the branch office nearest you or write for more information today.

A. E. Staley Mfg. Co., Decatur, Illinois
Branch Offices: Atlanta · Boston · Chicago · Cleveland · Kansas City
New York · Philadelphia · San Francisco · St. Louis

Sweetose®
CORN SYRUP

When inquiring check 8224 opposite last page

New! Improves Chocolate!

INTENSITOL

Synthesized Chocolate Flavor Intensifier

Completely new development! Heretofore unobtainable flavor aromatics, produced in our laboratories, will dramatically improve the deliciousness of your chocolate flavored products.

In conjunction with cocoa powder or chocolate liquor add INTENSITOL to your product and you restore delicate volatile flavor aromas universally lost during manufacturing processes. This new synthesized chocolate intensifier in your product assures the ultimate in *flavor's richness, taste* and *aroma.*

Wonderfully improves:

cakes • cookies • puddings • syrups icings • dry mixes • candies • ice creams

and all other chocolate flavored confections.

Send for samples, prices & information.

FLAVOREX CO.

MAKERS OF FINE FRUIT JUICE FLAVORS

302 S. CENTRAL AVE., BALTIMORE 2, MD.

When inquiring check 8225 opposite last page

ingredients

Make emulsifiers from sugar, edible fats

Sugar esters especially suitable for food use

A number of firms here and abroad have been licensed to manufacture a new group of emulsifying agents described as sugar esters of fatty acids, obtained from sugar and animal fats or vegetable oils. Two American manufacturers are ready to supply them on a commercial basis.

Typical of their applications will be facilitating mixing of chocolate drinks and increasing smoothness of French ice creams.

The agents form a protective film between two liquids, so that the droplets of one remain suspended in the other instead of separating out. Report of the research discussed two different sugar compounds. One is a sucrose monoester, an emulsifier which holds drops of oil suspended in water. The other, a sucrose diester, is a water-in-oil emulsifier. Emulsions prepared with mixtures of the two compounds last longer, before separating, than those from either compound alone.

(Report on these emulsifying agents was presented before 131st national meeting of the American Chemical Society by Dr. Foster D. Snell, Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y.)

Prevents stickiness in candies

Weather conditioner prevents stickiness and increases shelf life of many confections, such as brittles, caramels, chewing candies, hard candies, candied popcorn, and others. Odorless, tasteless product is either dusted on or added directly to cooked batches. Cost to use is reckoned at less than ½c/lb.

(Setsquick is product of Henry H. Ottens Mfg. Co., Dept. FP, 129 S. Front St., Philadelphia 6, Pa. Check 8226 opposite last page.)

"Emulsifier" is not the most stimulating of words

The word "emulsifier" never made anybody hungry. It suggests chemistry and test tubes and great big process kettles, whereas people (even chemists) like to think of either a) Grandma by the pantry whipping up something 'specially delicious or b) *la haute cuisine*, an art form which cares not a fig about the depression of interfacial tension.

It so happens that in foods where fat and non-fat must stay united in appetite-rousing texture, the health of the sales curve usually demands a little something to reduce interfacial tension. We propose *Myverol® Distilled Monoglycerides*.

Monoglycerides have been components of human food since long before there were any chemists. In *distilled* monoglycerides there are big advantages. Because they are virtually straight monoglyceride, unaccompanied by other substances from the reaction mixture in which they are commercially produced, a very small quantity does the emulsifying job. This saves money. There is nothing to affect flavor. There is no residual catalyst to rob you of the very monoglyceride it helped produce.

If you suspect that a product of yours could use help for its stability of texture, we shall be very happy to look into it with you. We make a lot of different kinds of distilled monoglycerides for a lot of different food purposes. Write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies and Company, Los Angeles, Portland, and San Francisco • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

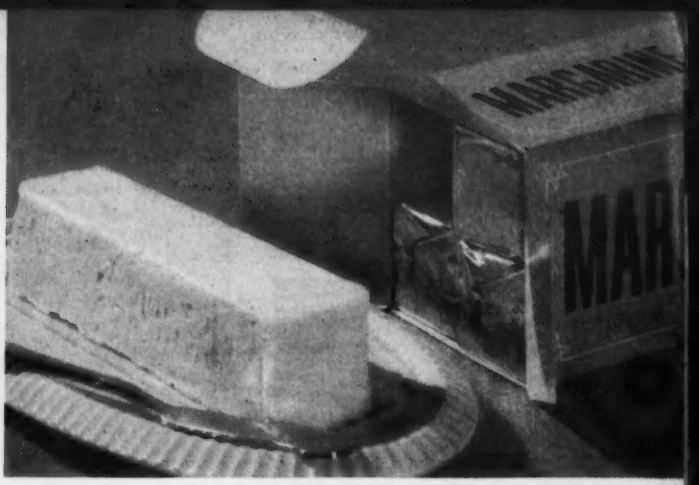
DPi

Also . . . vitamins A and E in bulk for foods and pharmaceuticals

Distillation Products Industries

is a division of **Eastman Kodak Company**

When inquiring check 8227 opposite last page



A more concentrated flavor and aroma for your food products with...

NEW TEKNIKAN

Here's what it is...Teknikan is a dry Sweet Dairy Whey at special fat levels, that has been processed for the food industry by exclusive manufacturing methods. It gives you that special dairy solids flavor which is one of the "most wanted" in many food products today. Your product, containing Teknikan, will retain its desirable flavor and aroma longer.

Here's what it does

1. Teknikan when used in margarine, produces a superior dairy spread flavor.

2. Teknikan gives chocolate that well-known rich product flavor.

3. Teknikan assures you of sharper, more delicious spaghetti and macaroni dinners.

4. Teknikan brings out the sharp, wonderful flavor of powdered cheeses.

5. Teknikan adds a more mouth-watering natural dairy flavor to cakes, rolls and biscuits.

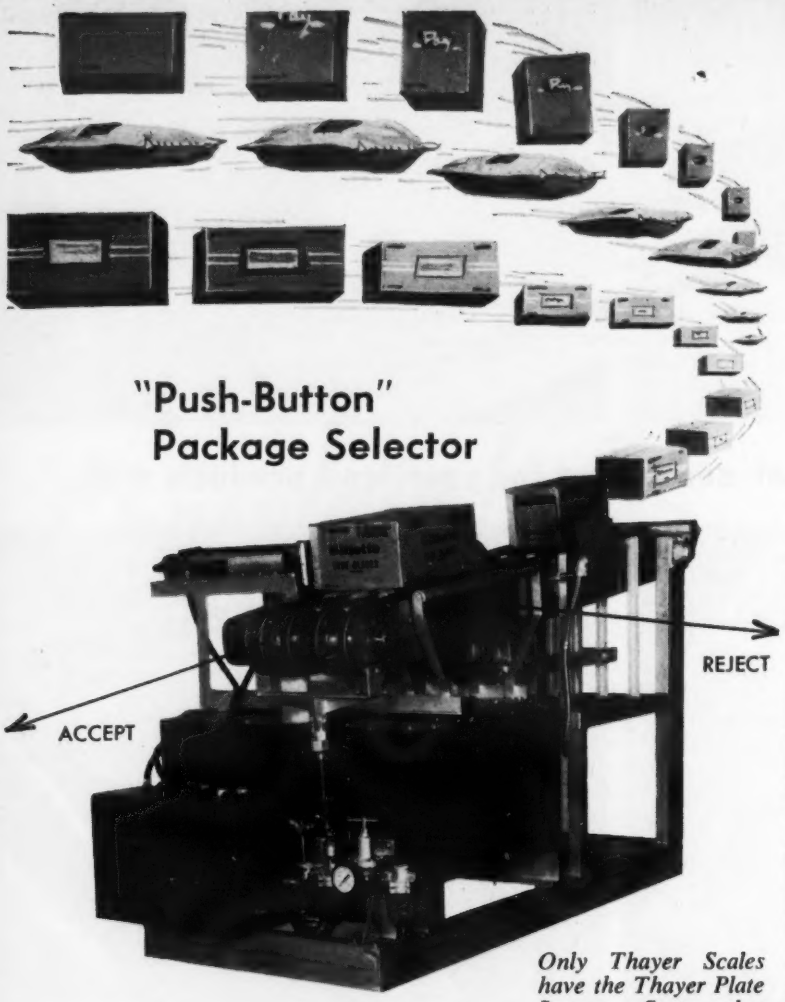
Only the highest quality special Sweet Dairy Whey is used in the manufacture of new Teknikan. Try it today ...it's economical...get the flavor you desire by merely using varied concentrations.

For additional information and working samples (be sure to state product application); please write our Technical Service Department 119.

For more information on product at right, specify 8228 see information request blank opposite last page.

Valley Fresh **Teknikan**

WESTERN CONDENSING COMPANY, Appleton, Wisconsin • World's Largest Producer of Whey Products



Only Thayer Scales have the Thayer Plate Leverage System that is guaranteed accurate for the life of the scale.

CHECKWEIGHING assorted packages with unvarying accuracy

With this Thayer Scale Autoweightion System the dispatcher, at a remote location, turns a selector control to any one of twenty packages to be shipped. The proper item will be discharged upon a common conveyor line which passes over the Thayer Checkweight Scale. The scale positions the various size packages and is automatically set to the correct tare and net for each. Over or underweights are sidetracked. Correctly filled packages are delivered. Amazing accuracy is retained regardless of shock or dust conditions. Please write for engineering data.

THE Thayer SCALE

BATCHING • FILLING • CHECKING — AUTOMATICALLY BY WEIGHT

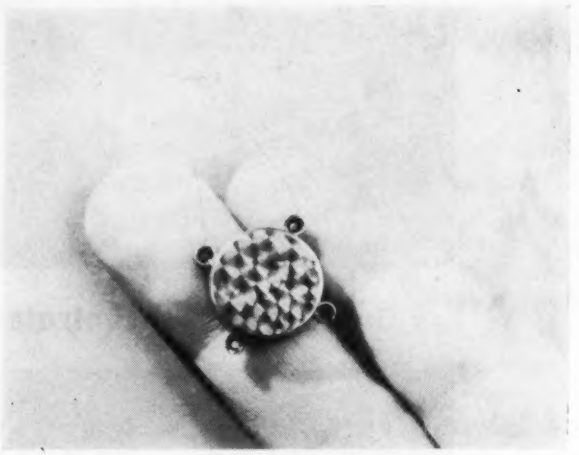
AUTOWEIGHTION

THE THAYER SCALE CORP., 6 Thayer Park, Pembroke, Mass.

When inquiring check 8229 opposite last page

ideas gleaned from

- research
- other industries
- managerial practices



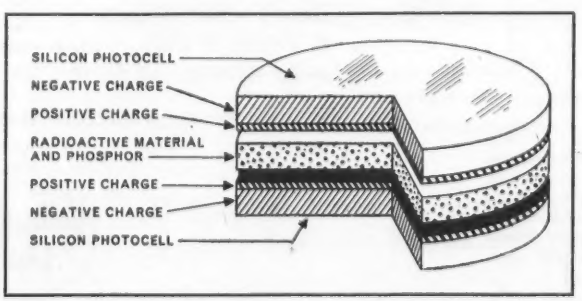
Nuclear battery is completely safe for extensive personal use

Tiny nuclear-powered battery

delivers power continuously for five years

Miniature nuclear-powered battery capable of delivering electrical power continuously for at least five years has been developed jointly by Elgin National Watch Co. and Walter Kidde Nuclear Laboratories, Inc. Approximately half an inch in diameter, battery has nominal output of 20 microwatts. According to its inventors, it is first such device to be completely safe for extensive personal use without special precautions. Decay energy of beta-emitting radioisotope is used as source of energy.

Operation of battery depends upon conversion of this energy — from beta emissions to light, and from light to electricity. Light source consists of mixture of finely divided phosphor and an oxide of Promethium 147, one of most abundant nuclear fission products. Beta particles emitted by Promethium are absorbed by phosphor and converted into red and infrared light. This light is captured by two



Cutaway diagram illustrates components of battery

or more photocells and transformed into electrical current. Battery is not yet commercially available, has obvious potential for such uses as hearing aids, small portable radios, powered wrist watches. Other uses should become apparent as further development continues.

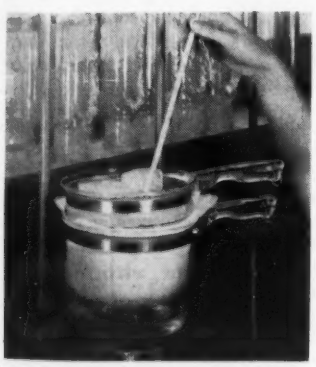
(Information presented here is through the courtesy of Walter Kidde Nuclear Laboratories, Inc., Dept. FP, 975 Stewart Avenue, Garden City, L.I., New York.)

Nylon base batting shows versatility

Used as filter medium and insulation

Uses: In thermal insulation, liquid and gaseous filtration, vibration absorption, and packaging applications in the food industry.

Features: Rapid drying and resists most acids and alkalies. It withstands continuous temperatures of 300°F. Light in weight and dimensionally stable under extreme cold and heat up to melting



Batting insulates ice from boiling water

point of nylon itself. Because of its strength, the versatile material can be used independently of support in many instances.

Description: Fabric batting is made by crimping nylon fibers and permanently locking them together by a

The Three Hazel-Atlas "Imps" Say—

chicks, oodles of noodles, and minced meats —bees, beans, and slaw treats

... sell better in our glass packages!

Whatever you pack, it will get more sales *impact* and produce more *impulse* sales in beautiful H-A packages, because:

1. Your foods' appetizing color and shape are salesmen with *silver tongues*, when you let them speak for themselves in a beautiful H-A container. Fruits, vegetables, meat, preserves—all products keep their fresh personality when their natural beauty is displayed in a crystal-clear H-A jar.

2. You give your product two selling lives when you pack in an H-A decorated tumbler—*first* selling your food with sparkling design and color from the self-service shelf, *continuing* to sell in the consumer's home as an often-seen re-use container.

Rigid quality-controls keep H-A containers uniform in size, shape, clarity and color. You are sure of fast, dependable delivery service during sales peaks and emergencies, served by H-A's nationwide network of glass plants and warehouses. For details, ask your nearest H-A representative.

...glamour in glass!

HAZEL-ATLAS GLASS

Division of CONTINENTAL CAN COMPANY

WHEELING, WEST VIRGINIA

When inquiring, check 8230 opposite last page

patented chemical-thermal process. Material is produced in a range of weights from 2 to 8 oz per sq yd and in widths up to 55".

("Ny-Sul-Loft" is made by Star Woolen Co., Dept. FP, Cohoes, N. Y. . . . or for more information check 8232 on the convenient Reader Service slip which is located opposite last page.)

Low-calorie peanuts may be next

Solvent-bath removes oil, protein content unchanged

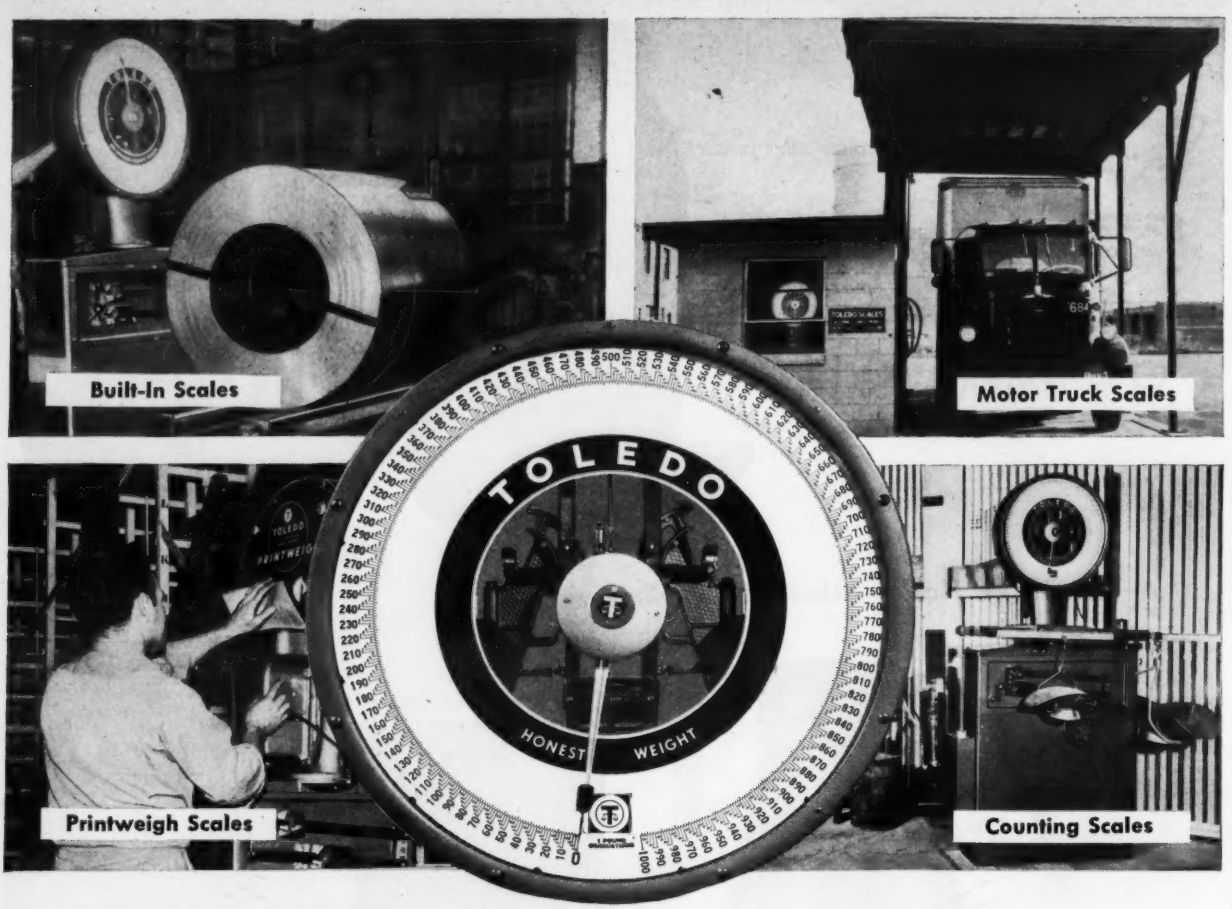
Peanuts may one day be on low-Calorie diets if laboratory experiments can be developed to a consumer basis. Recent research has shown that a solvent-bath process can remove oil from peanuts without changing their physical appearance.

Oil makes up about 50% of peanuts by weight. An ordinary handful of peanuts — 15 to 17 nuts — contains about 84 calories. De-oiled nuts contain 17 calories.

The laboratory experiments show that removal of oil does not destroy high protein value. After being subjected to solvent-bath process the nuts are milder and sweeter than ordinary peanuts. Both color and flavor of the de-oiled nuts can be improved by roasting. University of California, Davis, (California).

Loss of flavor, vitamin C noted in milk stored in artificial light

Experiments at University of Connecticut indicate that artificial light can be detrimental to milk stored for up to four days at 40°F. Vitamin C loss was as high as 99% (after four days exposed to 18 foot-candle fluorescent light source), compared to 80% loss after four days in dark. Oxidized flavor development also became apparent after storage in light.



THIS FAMILIAR FACE . . . helps solve plant-wide cost control problems *Everywhere!*

This "face" identifies dependable, versatile Toledo scales. You'll see it plant-wide wherever managements see weighing in its true perspective—*as a vital element in the overall cost control system.*

This means the right scales in the right places . . . to supply basic accounting records of materials received, processed, shipped or transferred. Weight records directly affect costs, inventory, quality and customer relations. They are *fundamental* to sound cost control. Today's pressure on profits calls for integration of weighing in a *plant-wide weighing system.*

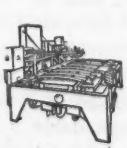
To learn the job *your* scales are now doing, we invite you to send for the new Toledo Weight Fact Kit. It will help you determine how well your scales measure up as a weighing system—help you detect weighing inefficiencies that drain profits. **REQUEST YOUR WEIGHT FACT KIT NOW.** No obligation. Address Toledo Scale Company, 1419 Telegraph Road, Toledo 1, Ohio.

TOLEDO® **HEADQUARTERS FOR SCALES**

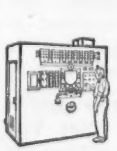
CUSTOM PRODUCTS FOR INDUSTRY

REMOTE DIGITAL WEIGHTS. Toledos automatically transmit weights to electric office machines located anywhere.

ELECTRONIC SCALES give electronic wings to weights; head may be located anywhere.



TESTING Toledos today test a wide range of parts; this device for leaf springs.



AUTOMATIC BATCHING SYSTEMS interlock batteries of scales.

When inquiring check 8231 opposite last page

. . . Fluid Power news

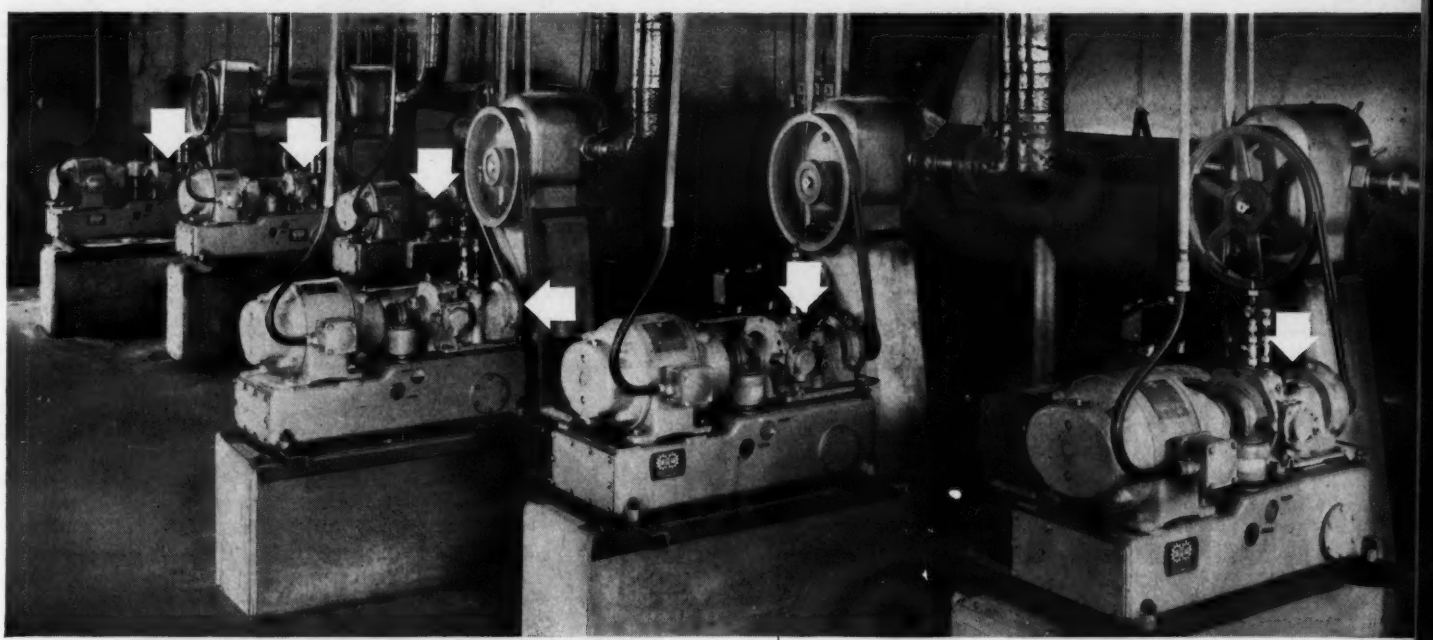
REPORT NO. 11,300 NEW LIQUID LEVEL CONTROL

From Oilgear Application-Engineering Files

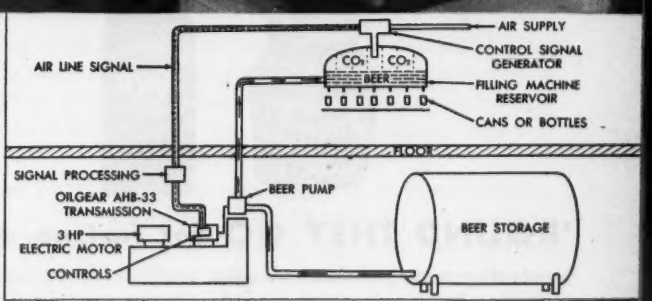
HOW OILGEAR DRIVE AND CONTROL SYSTEM STABILIZED BEER FILLING LEVEL

CUSTOMER: *Large Western Brewery (Name witheld by request)*

DATA: Highly carbonated beverages must be handled gently. Throttling flow of beer into filling machine reservoirs causes foam and irregularity of liquid height, making accurate filling of cans or bottles difficult. These reservoirs are small compared to the flow through them. Costly losses are incurred on tax-paid cans "in process" due to under or overfilling. Any beer pump drive-control system must respond immediately, have smooth action, and be unaffected by daily wash-downs required to maintain sanitary operations. Accurate automatic control, dependable operation, and ease of maintenance—as always—are important factors in the selection of this equipment.



SOLUTION: Shown "on the job" above, are 6 Oilgear AHB-33, two-way, "Any-Speed" transmissions driven by 3 hp electric motors, mounted on standard reservoir bases. Transmissions drive beer pumps through dual "V" belts. Beer is pumped from storage tanks to bottle or can filling machine reservoirs on the floor above. Liquid level in filling reservoirs is controlled automatically by a low pressure CO_2 signal . . . as level rises, pressure rises . . . as level falls, pressure falls. Translated to air pressure signals, which, transmitted to controls on Oilgear transmissions, automatically-instantly increase, decrease, reverse, or stop the beer pumps. Where former throttling system caused foam and irregular levels, this Oilgear system holds reservoir level to $\pm 1/16''$ under continuous operation . . . assuring accurate filling of each can or bottle. Beer pumps are flushed under water pressure without disconnecting drives. Several years of continuous service have proven drives to be extremely dependable under all conditions, with little or no attention.



Similar Oilgear "Any-Speed" drives have improved performance on can closing, filling; paper, printing, textile, tape, and rubber processing machines; extruders, capstans, winders, stokers, centrifuges, gang-saw feeds, saw mill carriages, conveyors, and the like. They provide efficient conversion of any constant rotary motion to accurately controlled variable rotary motion . . . smooth, stepless, uniform acceleration from zero to maximum in either direction . . . manual, hydraulic, electric or electro-hydraulic controls—providing complete flexibility of location . . . low power consumption—using power only in proportion to work performed . . . durable, trouble-free, low maintenance due to simplicity and automatic lubrication of all rotating parts.

Oilgear Application-Engineering can also provide practical solutions to your linear or rotary drive problems. Call the factory-trained Oilgear application-engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

THE OILGEAR COMPANY

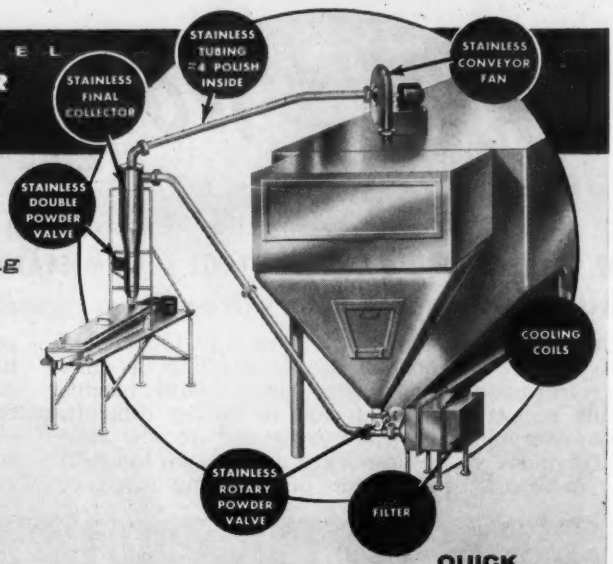
Application-Engineered Fluid Power Systems

1586 WEST PIERCE STREET • MILWAUKEE 4, WISCONSIN

For more information on product at right, specify 8233 see information request blank opposite last page.

HENSZEY

STAINLESS STEEL
POWDER COOLER
and CONVEYOR



an all stainless steel sealed system that automatically combines cooling and conveying with filtered air... from drying chamber to package.

designed with the future in mind!

to allow you to meet any present or future requirements calling for cooled packaged product. Powder is continuously cooled to 100° F. and sent to your packaging department. There is no powder loss, as system operates under a vacuum.

SIMPLE
An easily installed system engineered to your specific cooling and conveying requirements. Comes as a packaged unit complete with fan, powder valves, collector, filter, cooling coils, and piping.

RUGGED
Collector, powder valves and the heavy 18 gauge 304 stainless steel pipe will maintain its polished sanitary appearance even after years of operation, disassembly and cleaning. You are assured of low maintenance and trouble-free operation.

SANITARY
Powder contacts nothing but polished 304 stainless steel. Will meet the most rigid sanitary specifications. System is under a vacuum to insure no powder leaks. Only dry, cool, filtered air is used. Disassembled in minutes for cleaning and inspection.

FLEXIBLE
Powder can be conveyed to the location of your choice. Packaging can be moved out of the processing room. No screws, augers, or elevators.

QUICK INSTALLATION
Your prefitted system arrives as a package. Can be installed by your own maintenance crew. Simple instructions enable you to install the entire system in a few hours.

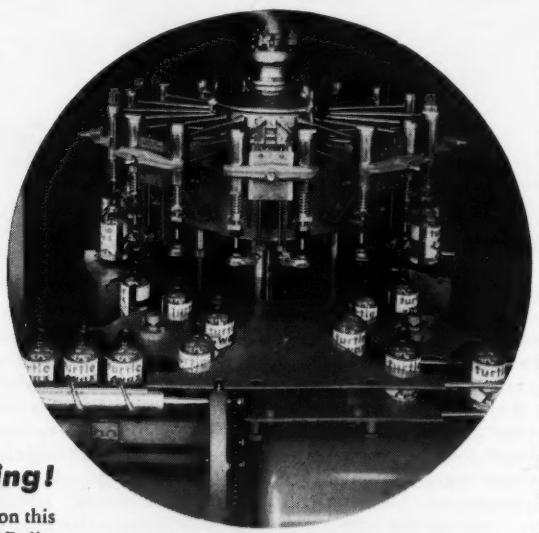
HENSZEY COMPANY • Department F • Watertown, Wisconsin

Manufacturers of: Multiple Effect and Single Effect Evaporators, Spray Dryers, and Tubular Preheaters.

When inquiring check 8234 opposite last page

PNEUMATIC

Rotavac



'ROUND THEY GO ***for fast, no-drip filling!***

Speeds of up to 250 per minute are quite practical on Pneumatic's smooth running, space saving ROTAVAC vacuum type filler. It handles light and heavy liquids equally well – alcoholic or oil base. Containers may range in size from one ounce to the standard one gallon jug.

Made in 18 and 30 head models, employing an exclusive fill principle which permits accurate control of filling heights with *absolutely no drip or sputter!*

Many of the country's most famous pharmaceuticals, soaps, chemicals, liquors, cosmetics and condiments are filled on this compact, stream lined unit. Send for Bulletin No. 130, giving complete design and performance specifications. Complete bottling machinery—air cleaning, gravity and vacuum filling, capping and labeling.

★ ★ ★

PNEUMATIC SCALE CORP., LTD., 67 Newport Ave., Quincy 71, Mass. Also: *New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds, England. Canadian Division: Delamere & Williams Company, Ltd., Toronto.*

PNEUMATIC

Packaging and Bottling Equipment

When inquiring check 8235 opposite last page

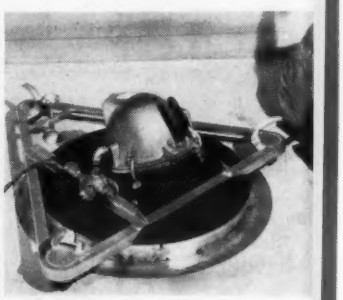
ideas

Grain silo light fixture is dust-tight, portable

Uses: Illuminating interiors of grain storage silos.

Features: Fixture is portable, dust-tight, has been approved by Underwriters' Laboratories in areas containing flour, starch, or grain dust.

Description: Aluminum unit consists of floodlight mounted



Dolly easily spans 33" manhole

on triangular, caster-equipped dolly, which easily spans 33" diam bin manhole. Floodlight accommodates 250-watt bulb.

(Grain elevator lighting fixture is manufactured by Crouse-Hinds Co., Dept. FP, Wolf & Seventh North Sts., Syracuse, N.Y. . . . or for more information reader may simply check 8236 on form opposite last page.)

"Sorry I dropped your check in the mixer Flanagan, . . . like to make a little loan? . . ."

Cage cooling systems cut poultry losses

Wilbur O. Wilson, poultry scientist, and Sam A. Hart, agricultural engineer, of the University of California, Berkeley, stress the importance of cooling caged hens under heat stress. They advise: "The best system to prevent death is fogging the birds with a fine mist water spray. Fogging nozzles should be set 6 to 8′ apart and should operate about one minute out of every 10, more often if heat is extreme. Cost is about 30c per bird."

A gasoline or electric operated mobile cart, with sprayer on top, provides a temporary system. Experimenters in Texas have used an evaporative cooler blowing on the birds. It is explained that "the probable reason this doesn't work in California is that evenings there are cooler than in Texas."

Preheating halts gel for HTST canned milk

Workers at University of California have found that preheating milk in the concentrated state, followed by dilution to standard composition and sterilizing will prevent gel formation in subsequent storage. Appearance of gel has been major drawback to use of HTST processes for canned milk. Color and flavor are not affected by the preheating process, and actual time-temperature conditions are dictated by concentration, season, and milk origin.

$1 MILLION SAVED

Read how H. J. Heinz Co. was able to reduce packaging costs over $1 million during the past year. Story begins on page 36.

FMC SWEET CORN HARVESTER
LETS YOU PICK 'ROUND THE CLOCK
—WHEN THE CORN AND YOUR PLANT ARE READY

1st Choice of Canners, Growers, Operators!

- Cuts picking costs up to 57%
- Delivers 10% more cases of "cut-off" corn to the cannery—less green weight
- Works day and night, under all weather conditions
- Reduces labor problems—does the work of 10 to 15 hand pickers
- Mounts on most tractors
- Simple operation, with all controls convenient to driver
- Sturdy construction throughout for trouble-free operation, lowest maintenance

Save minutes and dollars with the rugged FMC Sweet Corn Harvester, the only machine specifically designed for sweet corn harvesting. Reliability and dependability are proved by performance records season after season, under all conditions—in heat, dust, rain, rough fields—in night and day operation.

Minutes mean quality, for corn must be picked when it's ready! Picking delays and interruptions common to hand picking operations downgrade product quality and disrupt plant schedules. That's why each season finds more growers switching to FMC Sweet Corn Harvesters, always dependable, always on the job when there's picking to be done.

Minutes mean profits. One FMC Harvester replaces 10 to 15 hand pickers, with a reduction of up to 57% in picking costs! There's a 10% bonus in increased cut-off weight—up to 10% more corn per ton over hand picked corn. In addition, smooth, more profitable plant scheduling is assured.

Now is the time to order your FMC Sweet Corn Harvester for consistently higher yields at lower costs.

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

fmc FOOD MACHINERY AND CHEMICAL CORPORATION ®
Key to food equipment

When inquiring check 8237 opposite last page

Washing stage in Seabrook Farms processing line. Here Kale is being washed and will next go into steam room for blanching. All water is chlorinated.

HOW W&T IN-PLANT CHLORINATION
increases vegetable processing rates

Seabrook Farms at Seabrook, N. J. processes over 100,000,000 pounds of frozen food annually. For every 10 ounce package of frozen food, an average of 7 gallons of chlorinated wash water is used.

Mr. E. L. Morin, head of Seabrook Farms quality control department says, "By the introduction of Wallace & Tiernan Chlorination equipment into our in-plant process, we have reduced our clean-up periods by 50%. We must process at top capacity during harvest seasons; reducing clean-up time increases our daily production rate. In the instance of peas alone, In-Plant Chlorination reduced clean-up times during a 24 hour period from two hours to one... still maintaining standards of low bacteria counts in the product."

For information about W&T In-Plant Chlorination send for Bulletin I-57.

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

MERCHEN GRAVIMETRIC FEEDERS & METERS

for dry free-flowing materials

- automatic batch control
- continuous blending
- materials accounting

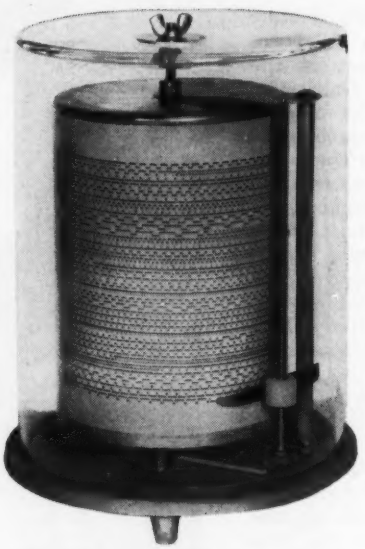
Accuracy 1%
Rates 3 to 3000 lbs. per min.

Write for Bulletin No. M-32

WALLACE & TIERNAN
INCORPORATED
25 MAIN ST., BELLEVILLE 9, N. J.

M-32

When inquiring check 8238 opposite last page



Transparent cover permits observation of recorded data at any time

records length, time of equipment operation

Low-cost instrument uses no ink — stylus cuts red line on wax-coated, waterproof paper

Uses: Records length and time of operation of individual machines, process units, or entire processes.

Features: Operations recorder uses wax-coated, waterproof paper to record data. Stylus cuts the white wax to reveal red paper beneath, producing sharply contrasting line without blurring or smudging. Unit costs approximately $60.

Description: Drum recorder rotates at specified speed. Stylus moves vertically (about ⅛"/revolution) with drum rotation, cutting record according to input signal. Use of 24-hour rotation chart allows comparison of consecutive days, since all are lined up vertically. Housing can be glass, plastic, or metal. Transparent housing permits continuous tamper-proof inspection of record.

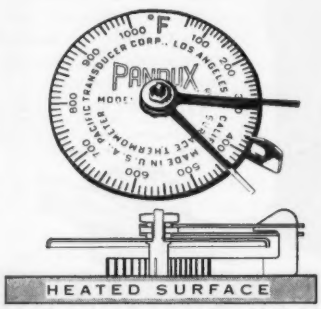
Recorder can be mounted in any position. Various combinations of drum speeds are available. Unit is 6" x 8", weighs approximately eight lb. Operation can be on 150 v 60 cycle, or other voltages and frequencies as required.

(MD-Jr. operations recorder is product of Gorrell & Gorrell, Dept. FP, Haworth, N.J. . . . or for more information reader may simply check 8239 on Reader Service slip which is located opposite last page.)

Surface temperatures easily checked with compact thermometer

Maximum and minimum pointers; range 50-1000°F

Features: In addition to being an instrument for surface temperature indication it also provides record of maximum and minimum temperature in ovens. Compact and easy to read; maximum and minimum pointers are quickly reset.



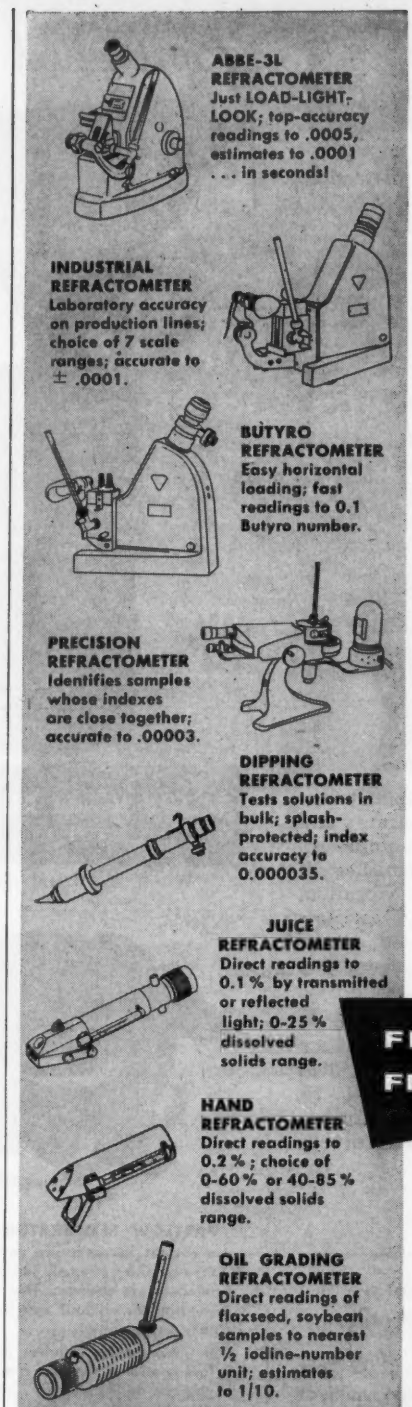
Dial of compact thermometer has OD of 1¾"

Description: Made of stainless steel with dial of 1¾" overall diameter. Alnico magnet permits attachment to ferrous surfaces. Factory calibration is within ±2%, and user can re-calibrate when necessary. Ancillary pointers show excursions over any desired period.

(Model 575M thermometer is available from Pacific Transducer Corp., Dept. FP, 11836 Pico Blvd., Los Angeles 64, Calif. . . . or for more information check 8240 on form opposite last page.)

QUICK MOISTURE TEST

. . . has been developed by scientists at Corn Products Refining Company. Method employs principle of nuclear magnetic resonance, requires less than five minutes for most materials. Full report on its use for candy products begins on page 32.



ABBE-3L REFRACTOMETER Just LOAD-LIGHT-LOOK; top-accuracy readings to .0005, estimates to .0001 . . . in seconds!

INDUSTRIAL REFRACTOMETER Laboratory accuracy on production lines; choice of 7 scale ranges; accurate to ± .0001.

BUTYRO REFRACTOMETER Easy horizontal loading; fast readings to 0.1 Butyro number.

PRECISION REFRACTOMETER Identifies samples whose indexes are close together; accurate to .00003.

DIPPING REFRACTOMETER Tests solutions in bulk; splash-protected; index accuracy to 0.000035.

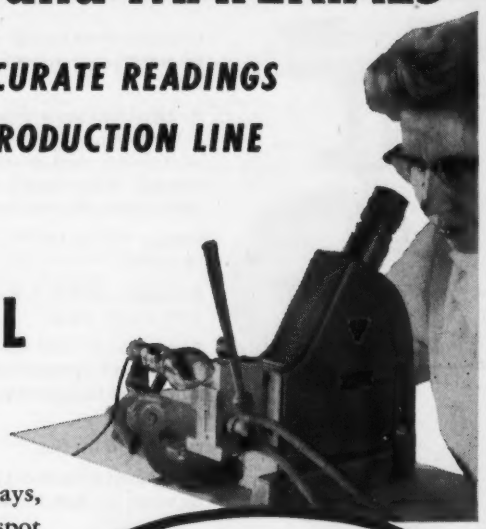
JUICE REFRACTOMETER Direct readings to 0.1 % by transmitted or reflected light; 0-25 % dissolved solids range.

HAND REFRACTOMETER Direct readings to 0.2 %; choice of 0-60 % or 40-85 % dissolved solids range.

OIL GRADING REFRACTOMETER Direct readings of flaxseed, soybean samples to nearest ½ iodine-number unit; estimates to 1/10.

SAVE TIME and MATERIALS

with FASTER, ACCURATE READINGS RIGHT ON THE PRODUCTION LINE



Bausch & Lomb

INDUSTRIAL

Refractometer

Avoid costly production delays, protect quality, with on-the-spot determinations of refractive index or % dissolved solids—accurate to 0.0001! Super-speed loading, reading, cleaning. Trouble-free: no adjustments, no moving parts. Sturdy, stable, for hard on-the-line use. And priced low enough so you'll want one for each testing area. Choice of 7 specific scale ranges.

NEW LOW PRICE only $350!

FILL YOUR QUALITY CONTROL NEEDS FROM INDUSTRY'S MOST COMPLETE LINE

Only the *right* instrument for the specific job can protect quality standards . . . save time . . . cut production costs. Only the complete, top-accuracy Bausch & Lomb line assures you the *right* instrument for *every* job; on-the-spot production line inspection . . . field checks . . . research. Find out now how the *right* B&L instrument makes peak efficiency easy.

MAIL COUPON FOR COMPLETE DATA

BAUSCH & LOMB OPTICAL CO.
60618 St. Paul Street, Rochester 2, N. Y.

Send me complete data on the following B&L Refractometers:

☐ Abbe-3L ☐ Precision ☐ Butyro ☐ Industrial
☐ Dipping ☐ Juice ☐ Hand ☐ Oil Grading
☐ I would like a demonstration of the B&L Refractometers checked above.

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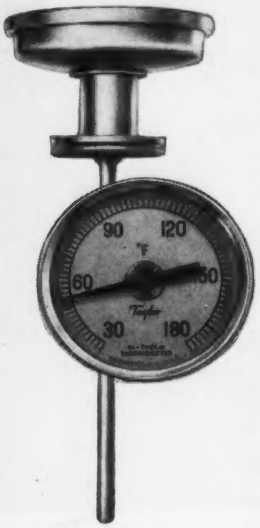
TITLE.....
COMPANY.....
ADDRESS.....
CITY..... ZONE..... STATE.....

BAUSCH & LOMB
SINCE B&L 1853

America's only complete optical source . . . from glass to finished product.

When inquiring check 8241 opposite last page

Taylor BI-THERM* DIAL THERMOMETER



SIMPLE
DEPENDABLE
RELIABLE

is ideal for all liquids requiring sanitary connections on pipe lines.

Rugged and corrosion-resistant, all exposed metal parts are of stainless steel, inert arc welded. Water-proof case for better performance, longer life.

Range: 30° to 180°F. and 30° to 240°F.

Accurate: within 1% of range over entire range.

Readable: 3" dial has black figures and graduations on aluminum background. Easy to read.

Price: $36.00 list.

Ask your Taylor Field Engineer, or write for **Bulletin 98272.**

Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

*Trade-Mark

Taylor Instruments MEAN ACCURACY FIRST

When inquiring check 8242 opposite last page

Lumenite AUTOMATIC CONTROLS

ELECTRONIC LIQUID LEVEL
INDUSTRIAL TIMERS
TIME SWITCHES
MAGNETIC SWITCHES

Ask for Bulletin

FL—Liquid Level
FM—Milk Level
FN—Nonconductive Liquid
ITC—Ice Thickness
BH—Boiler Level

Ask for Bulletin

LT—Time Switches
PC—Program Clocks
CR—Cycle Repeaters
R—Time Delay Relay
RMC—Automatic Reset

Lumenite Electronic Company
ENGINEERS DESIGNERS MANUFACTURERS
407 S. Dearborn Street Chicago 5, Ill.

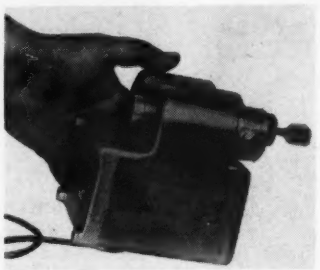
When inquiring check 8243 opposite last page

Versatile level detector accurate to 0.01"

Uses: Automatic detection of liquid levels.

Features: Instrument is sensitive only to level variations, is accurate to 0.01". It has no floats, packing, flexible shafts, or long probes, can be mounted in any position.

Description: Control consists of motor-generator attached to paddle, driven at resonant frequency by AC input. Generator output energizes relay to operate any type of electrical equipment. In high level control, rising liquid stops paddle vibration, de-energizing relay. In low level, dropping liquid allows paddle to vibrate, energizing relay.



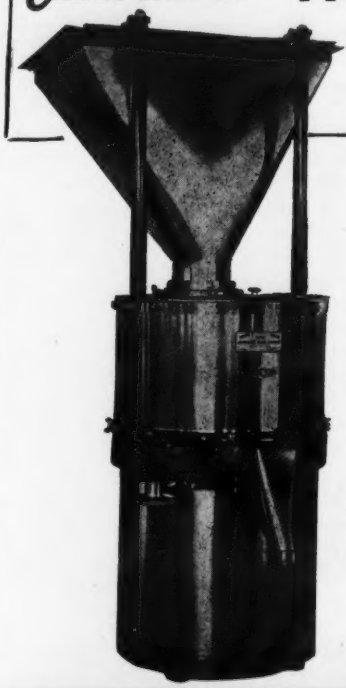
(Dynatrol level detector is available from Automation Products, Inc., Dept. FP, 3030 Max Roy St., Houston 24, Tex. . . . or for more information check 8244 on form opposite last page.)

Push button pH meter accurate to 0.1 pH unit

Reproducible to 0.02 pH; scale 0-14; two millivolt ranges

Features: Ready to operate at touch of a button. Has drift-free amplifier which can be adapted for potentiometer recorder output, automatic temperature compensation, and Karl Fischer titrations. Operator reading error is minimized with the mirror-backed scale (pH and millivolt) which eliminates parallax. pH readings are accurate to 0.1

Controlled ACCURACY at HIGH SPEED



MILLIGRAMS
GRAMS • OUNCES

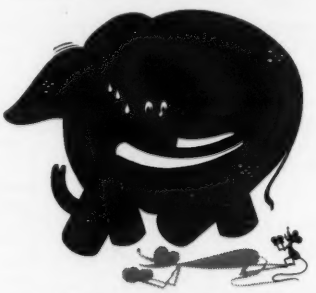
With this Model A PAK KING filler you can meter the above volumes accurately and at high speed. Spices, coffees, teas, cocoas, drugs, powders, and chemicals. Tea bags, coffee envelopes, pepper canisters easily handled. Compact machine in table or floor design; with or without extra supply hopper. Full automatics available.

Ask for Catalog No. 55 describing this machine; also net weighers, auger packers, sealers, conveyors, elevators, coupon inserters.

WEIGH RIGHT Packaging Machinery

WEIGH RIGHT AUTOMATIC SCALE COMPANY
JOLIET • ILLINOIS • U. S. A.

When inquiring check 8245 opposite last page



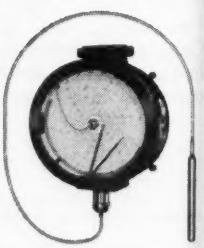
RUGGED but extremely SENSITIVE!

PARTLOW TEMPERATURE CONTROLS are built to withstand rough usage, but they're also extremely sensitive to slightest temperature changes. They'll take a lot of punishment without upsetting their accuracy and precision.

If your process requires precise temperature control in the –30°F to 1200°F range, you can do it better . . . *and at lower cost* . . . with Partlow Controls.

They're less complicated than thermocouples. Thick-walled capillaries and seamless tubing assure almost indefinite life. Elements can be replaced on the spot.

What's your control problem?
Tell it to Partlow!



MODEL RS
Recording Temperature Control

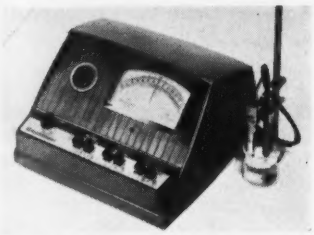
Ask for Partlow's Condensed Catalog

partlow

the pioneer in mercury thermal controls

THE PARTLOW CORP., Dept. FP-657, NEW HARTFORD, N.Y.
Offices in All Principal Cities

When inquiring check 8246 opposite last page



Push buttons control pH meter, temperature compensation, selection of mill; volt range

pH unit and reproducible to 0.02 pH.

Description: Line-operated instrument has automatic correction for electronic zero drift and rapid push button control. Two millivolt ranges: 700-0-7 range and the extended 0 to 1400 millivolt range. The extended range is useful for oxidation-reduction titrations. "Zero" can be set at any point on the 0 to 1400 millivolt scale. Maker's 4990-83 glass electrode and 1170 reference electrode are supplied with instrument.

(Zeromatic (TM) pH meter is built by The Scientific Instruments Division — Beckman Instruments, Inc., Dept. FP, 2500 Fullerton Rd., Fullerton, Calif. . . . or check 8247 on form opposite last page.)

Simple vessel supports aid specific gravity determinations

Leaflet briefly describes instrument which supports interchangeable hydrometer vessels in accurately vertical positions on a swinging arm. This arrangement provides accessible location for hydrometer near a laboratory sink or when mounted on a standard laboratory tap.

Illustrations show how, after a reading is completed, the material can be discharged directly into the original container or to waste as desired, without operator's hands coming in contact with fluid.

Specific-gravity apparatus leaflet is issued by Rocyo Instruments, Dept. FP, 720 Arthur St., Albany, Calif. . . . or check 8248 opp. last page.

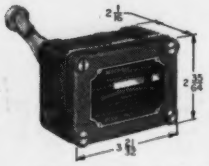
MICRO SWITCH . . . FIRST IN PRECISION SWITCHING

MICRO SWITCH Splash-Proof Switches give you precision, snap-action switching under extreme moisture conditions

Four basic actuator designs—wide variety of operating characteristics and electrical ratings. Available in both single-pole double-throw and double-pole double-throw contact arrangements.

Technical advice on applications for MICRO SWITCH precision switches is available at all branch offices. Stocks of switches are carried by distributors in all key cities. Look under "Switches, Electric" in the Yellow Pages.

Send for Catalog 83 for information on the full line of enclosed switches

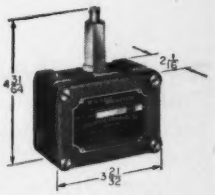


Type OP Switch with roller-arm actuator

This model is designed for operation by cams or slides. A seal on the shaft prevents liquid splash from entering through the actuator. The arm is field adjustable through 360°, allowing 90° overtravel in any position.

Characteristics of single-pole double-throw switch are: Operating force—½ to 1¼ lb.; Release force—¼ lb. min.; Pretravel—7/32 in. max. (8°); Overtravel—90° max.; Differential travel—.007 in. max. (¼°).

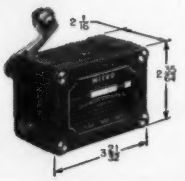
Type OP Switch with plunger actuator



This switch has a radius-tipped overtravel plunger. A stop ring near the tip permits a steady load of one hundred pounds on the plunger without injury to the enclosed switching unit.

Characteristics of a single-pole double-throw switch are: Operating force—3 lbs. max.; Release force—¾ lb. min.; Pretravel—5/64 in. max.; Overtravel—3/16 in. min. Differential travel—.004 in. max.

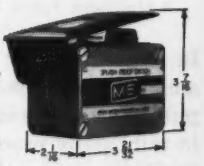
Type OP Switch with cross roller-lever actuator



This switch is designed for operation by cams or slides whose approach is from an angle perpendicular to the longitudinal axis of the switch. The arm is adjustable through 360°.

Characteristics of a single-pole double-throw switch are: Operating force—8 to 20 oz.; Release force—4 oz. min.; Pretravel—7/32 in. max. (8°); Overtravel—90° max.; Differential travel—.007 in. max. (¼°).

Type OP Switch with paddle-shaped actuator



This switch is widely used as a manual control for power equipment. The actuator provides 11¼ square inches of actuating surface, permitting fast, safe manual operation. A rubber bumper beneath the free end of the actuator protects the enclosed switching unit from shock.

Characteristics of a single-pole double-throw switch are: Operating force—2½ lbs. approx.

MICRO SWITCH
A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

When inquiring check 8249 opposite last page

for Food Processing Advertisers*

The emblem at right is that of NBP—National Business Publications. You've probably seen it before on our contents page . . . rate card . . or heading the FOOD PROCESSING listing in Standard Rate & Data. Because we're proud of it.

It signifies that FOOD PROCESSING has qualified for membership in the largest association of technical, scientific and professional journals in the United States. (We're proud, too, that our F. P. executive staff includes a past president of NBP and a member of its Board of Directors.)

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- **Unbiased editorial content**
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For men who manage the Food Processing Industries

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Creators of PUTMAN-STYLE Magazines
. . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

BPA NBP

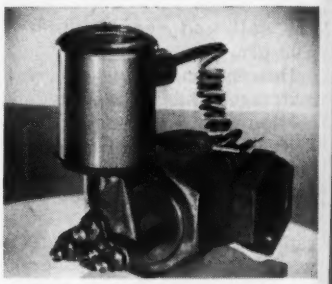
PUTMAN PP PUBLISHING

★ Courtesy of the publication MEDICAL ECONOMICS, creator of this copy, here adapted to FOOD PROCESSING

Solenoid controls grouped in convenient cluster

Uses: Suitable for a variety of general service applications and especially suitable for filling operations as well as in hydraulic systems and elevators.

Features: Provides independent controls for manual opening, and adjustment of flow, opening and closing speed. Four controls are grouped for convenient adjustment. One adjustment does not have the slightest effect on the other. Manual opening stem allows operation of valve in power failure or other emergency.



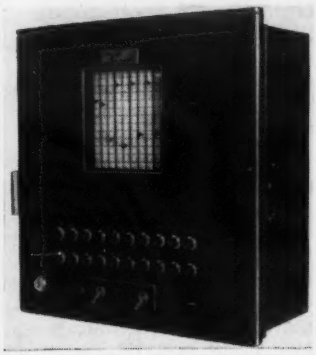
Solenoid valve with independent controls mounts on piping running at any angle

Description: Valve can be mounted on pipe running at any angle. It is available in sizes ½ to 2". Present maximum capacity is 300 psi. Valve is of packless design with unbreakable piston rings, full ports, and non-shock closing.

(Type HV valve is built by The J. D. Gould Co., Dept. FP, 4707 Massachusetts Ave., Indianapolis, 18, Ind. . . . or check 8250 on form opposite last page.)

Multi-point controller supplants four to ten temperature instruments

Uses: Permits automatic temperature control of four to ten separate units with one instrument. Controller applies to almost any installation suitable for two position control action. These include



Temperatures at many points set, checked on one panel

multi-zone ovens, batteries of batch processing units, and lab aging and reaction vessels.

Features: Great savings are provided in panel board space plus time saving convenience of setting and observing temperature at one location.

Description: In operation, a pulse timer and selector switch automatically connect thermocouples in sequence to the master control unit which compares each thermocouple voltage to its set point, and energizes or de-energizes the corresponding load relay to the process unit.

High measuring accuracy is insured by the null balance potentiometer measuring circuit which can be calibrated independently of the thermocouple and extension wire resistance.

Many temperature ranges are available between minus 400° and plus 3250°F for all standard thermocouple calibrations, and from 100° to 1600°F for resistance bulbs.

(Multi-point pyrometer controller is made by Thermo Electric Co., Inc., Dept. FP, Saddle Brook, N. J. . . . or check 8251 opposite last page.)

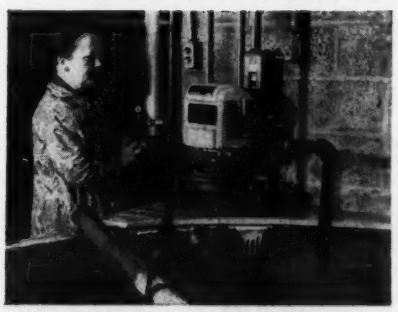
NEXT MONTH

FOOD PROCESSING will feature its regular section on Instrumentation and Control. The section will be expanded to include many extra articles, plus a round-up article on methods of measuring viscosity.

NEW

NEPTUNE STAINLESS STEEL LIQUID METER

ONLY TWO MOVING PARTS IN THE LIQUID



New Neptune stainless steel meter accurately measures sulfuric acid at Parwel Mfg. Co., Gloversville, N. Y.

Now you can achieve fine-instrument accuracy in the processing of corrosive liquids . . . in batching, blending, transfer, cost accounting, etc. . . . with this new Neptune Stainless Steel Meter.

Also important in processing applications, this Neptune meter ends many problems caused by contamination of liquids measured.

Based on the reliable Neptune positive displacement principal, its accuracy is completely protected from the effects of corrosion or corrosive wear. There are only two moving elements in contact with the liquid. The gear-train is mounted outside the casing, isolated from the liquid.

Available with Direct Reading, Print-O-Meter or Auto-Switch Registers. Size 1½", capacity 100 gpm. with most liquids.

Ask for Bulletin 94/10 NFP.

neptune

NEPTUNE METER COMPANY · 19 West 50th St., New York 20, N. Y.

BRANCHES IN: ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER • NEW YORK
NO. KANSAS CITY, MO. • LOS ANGELES • LOUISVILLE • PORTLAND, ORE.
SAN FRANCISCO-BAY AREA (MILLBRAE)

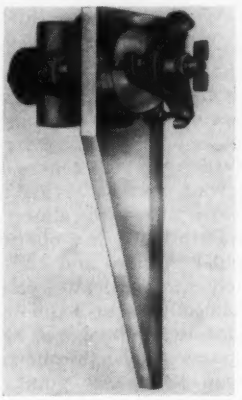
IN CANADA: NEPTUNE METERS LTD., 1430 LAKESHORE RD., TORONTO 14, ONT.

When inquiring check 8252 opposite last page

Lights liquid level gages without glare

Bulb has longer service life, delivers more illumination

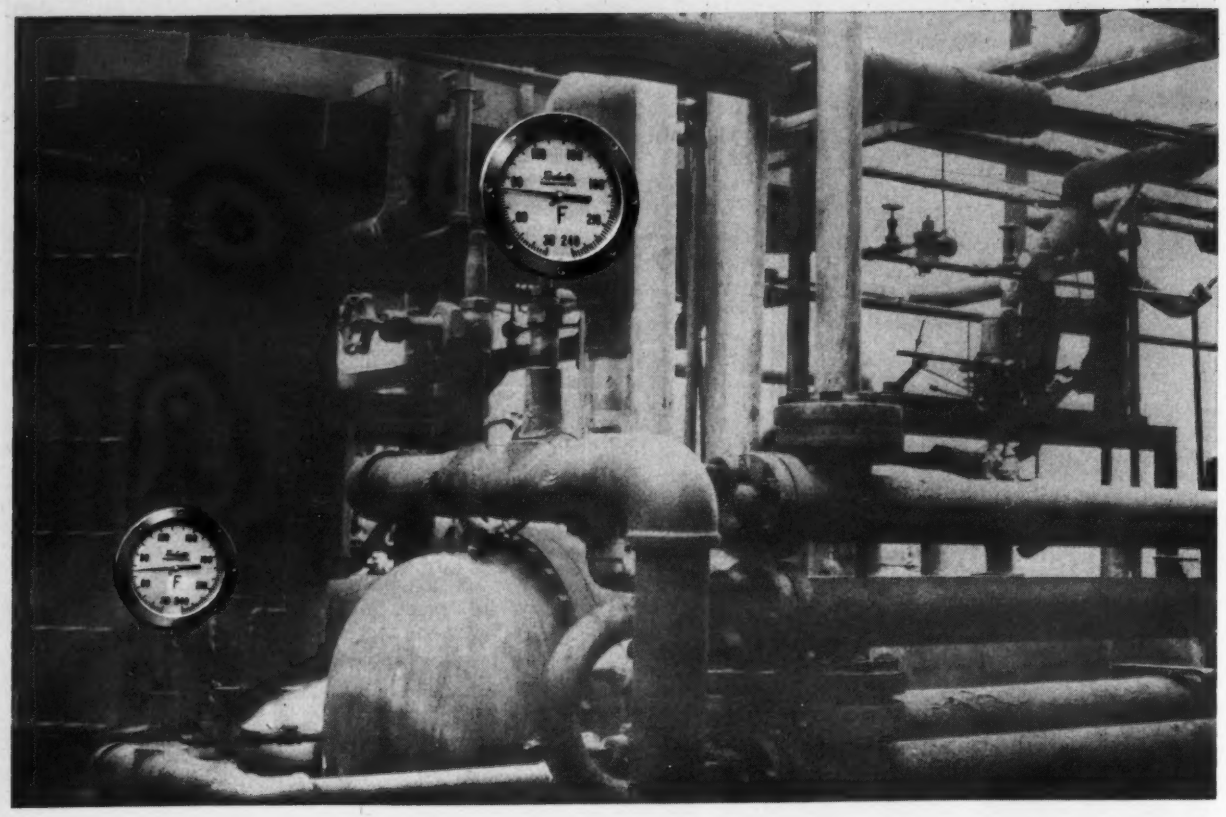
Features: Lights up entire gage glass length without glare spots. Mounts easily. Mounting arrangement provides space between plastic wedge reflector and gage glass to facilitate cleaning and leave air space for cooling. Explosion-proof and UL approved.



Plastic wedge reflects light from gage bulb

Description: Incorporates principle of solid wedge lighting. Light from single bulb is reflected from angular surface of plastic wedge. Bulbs are easily replaced. Illuminators are made in single and double sections in a variety of sizes.

(Illuminator for liquid level gages are built by Jerguson Gage & Valve Co., Dept. FP, Burlington, Mass. . . . or check 8254 on form opposite last page.)



There's an RMC thermometer for almost every industrial requirement

Dial sizes from 1″ to 5″, stem lengths from 2½″ to 70″, scale ranges from −150° F to +1000° F. These figures represent *only* Rochester Manufacturing Company's *standard* thermometer specification limits. There is practically no limit to what RMC can do in the way of *special* thermometer applications.

Standard or special, *all* RMC thermometers are made of corrosive-resistant stainless steel, have hermetically sealed non-fogging dial chambers, are available with RMC's exclusive external recalibration device, and are guaranteed accurate to 1% of scale range. Why not remove temperature indication problems from your unsolved list—turn them over to RMC.

Look to RMC for Full-Line Instrumentation— for manufacturers and users of processing equipment—and many consumer products.

DIAL THERMOMETERS

PRESSURE SWITCHES

PRESSURE GAUGES

LIQUID LEVEL GAUGES

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Tell us your requirements for direct mounting and remote indicating instruments, and let RMC Engineering skill provide the answers!

RMC

LIQUID LEVEL · TEMPERATURE and PRESSURE INSTRUMENTS

ROCHESTER MANUFACTURING CO., INC. • 111 Rockwood Street, Rochester 10, N. Y.

When inquiring check 8253 opposite last page

Control instruments enclosed in fiber glass

Entire assembly removes from case for servicing

Features: Housed in cases made of plastic-impregnated fiber glass, the complete instrument can be easily removed for servicing. Color of case is not surface finish but extends throughout the material. Door, held in place by cam-actuated knobs, can be completely removed. Plug in door removes to expose adjustment screw.

Description: Line includes instruments for indicating, transmitting, and controlling pressure and temperature. Temperature range: from −400° to +1000°F. Pressure range: 30″ Hg vacuum to 5,000 psi. As pneumatic receivers, instruments can accommodate 3 to 15, 3 to 18, or 3 to 27 psi signals.

(Series 1450 instruments in fiber glass cases are available from Fischer & Porter Co., Dept. FP, 951 Jacksonville Rd., Hatboro, Pa. . . . or check 8255 on form which is located opposite last page.)

Temp alarm operates over wide range

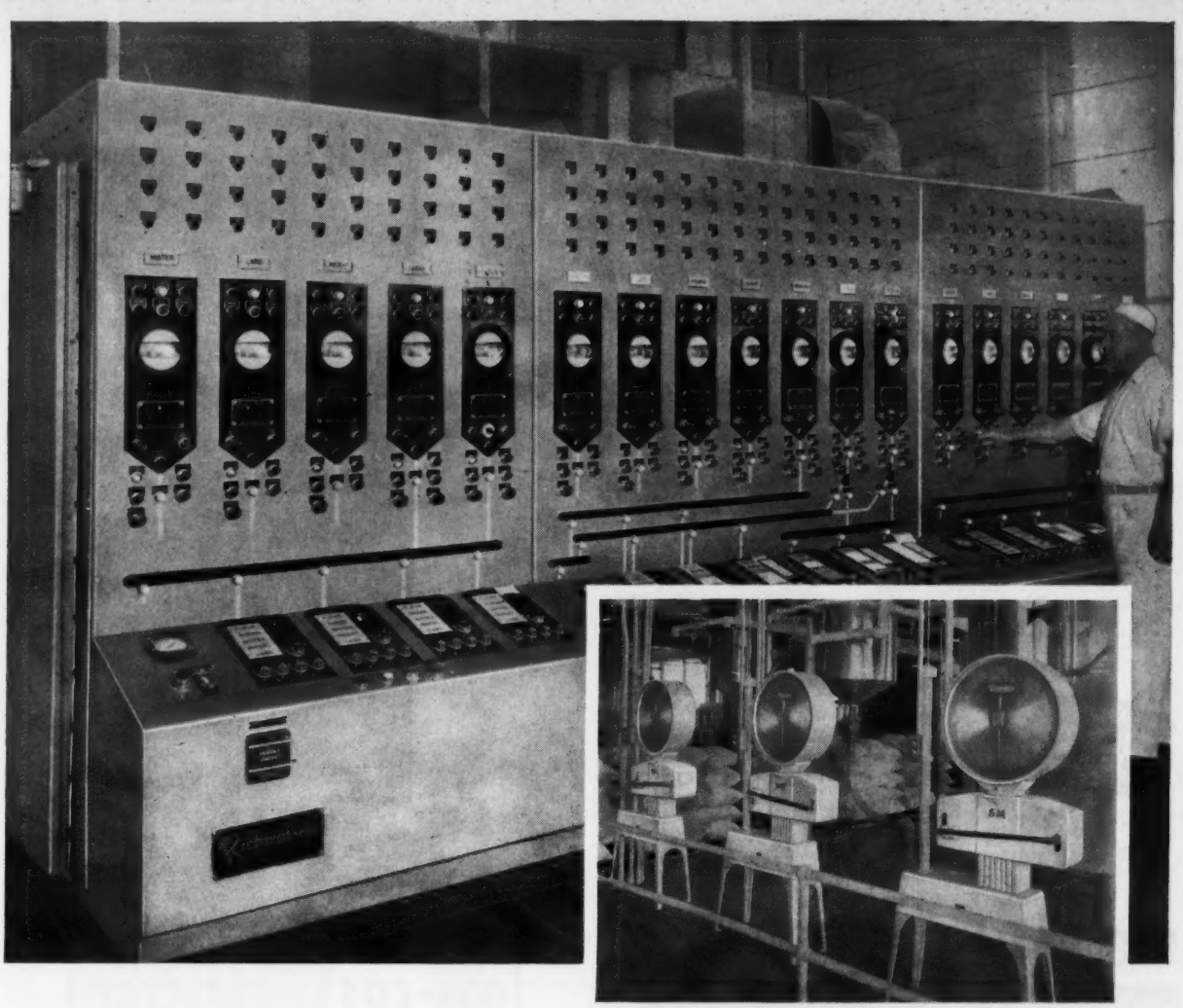
Thermostat factory-set to level specified by user

Uses: For sounding warning when an unsafe temperature is reached in refrigerators, freezers, brooders, and sterilizers.

Features: Has optional fail-safe remote telephone-hookup, as well as a 115 v ac remote signal provision.

Description: Unit utilizes thermostat preset to specified temperature which is enclosed in hermetically sealed frost-free tube. Thermostats are calibrated in range of −10° F to plus 300° F.

(Thermo-Alarm is made by Mack Electric Devices, Inc., Dept. FP, Myncote, Pa. . . . or for more information check 8256 on the convenient Reader Service slip opp. last page.)



BIGGEST PROPORTIONING PANEL IN FOOD INDUSTRY

...And Adaptable to Any Industry Requiring Precise Formulation

This Richardson Select-O-Weigh system is the most complete automatic proportioning panel yet installed in the food industry.

Coupled with a conveying system, the panel controls automatic feeding of material from any of 14 flour bins, two sugar bins, and storage tanks for shortening, invert, molasses, and water. With this system, the bakery can proportion three different formulas simultaneously. Every phase of operation is clearly indicated on the panel by means of signal lights, which graphically reflect actual material flow. Ingredients can be delivered in the sequence and proportions called for by a specified formula. When each phase of this operation is completed, a signal light on the panel notifies the operator. When an ingredient is delivered to the mixer, a light beside the panel card on the board flashes. The operator knows at all times the progress of each formula being delivered to the mixers.

CONTROLS

The entire Richardson Select-O-Weigh system is interlocked with all elements it controls, so that any operation can be halted if necessary. At the beginning of each weighing cycle a "ready-start" light flashes, indicating the scale is at tare. At the conclusion of each weighing, an automatic weight check is made. Under or overweight is indicated on the control panel and scale discharge is automatically held up for correction.

For additional information on this interesting installation, and engineering assistance in automating your operation, write Richardson Scale Company, Clifton, New Jersey.

4974

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY, CLIFTON, NEW JERSEY

Atlanta • Boston • Buffalo • Chicago • Cincinnati • Houston • Memphis • Minneapolis
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan • Geneva, Switzerland • Nottingham, England

When inquiring check 8257 opposite last page

New BUSCHMAN
TROJAN "A"
Portable Belt Conveyor

• Faster
• Safer

Rugged ALUMINUM ALLOY BOOM provides easier maneuverability . . . greater versatility!

UP . . . DOWN or any angle you want Hydraulically

- Reversible Travel: 12" Belt
- 10', 12', 14', 16', 18' and 20' lengths
- One-man operation . . . on-the-job economy
- Adjustable ultra-lightweight boom folds for easier shipment, storage
- Practical "booster" for gravity systems

WRITE TODAY!

Get cost-cutting details on the economical TROJAN "A" . . . ask for Bulletin #50AA.

PRODUCE MORE FOR LESS with Buschman CONVEYORS

C-338-EWB

THE E. W. BUSCHMAN CO.
4411 Clifton Ave., Cincinnati 32, Ohio

When inquiring check 8258 opposite last page

PROFITABLE WASTE RECOVERY

Link-Belt Liquid Screens clean waste water at large cannery.

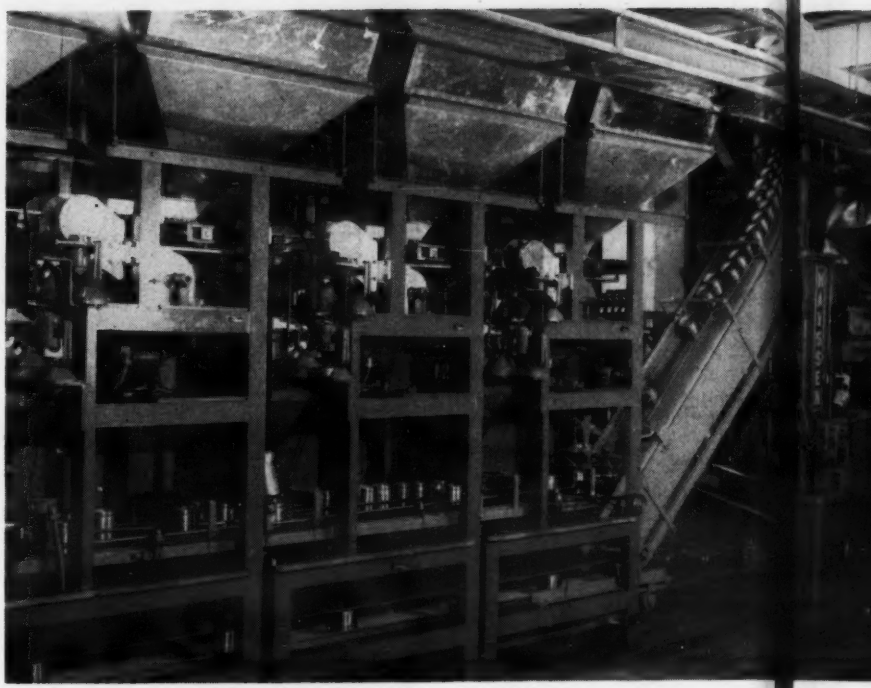
. . . with LINK-BELT
LIQUID VIBRATING SCREENS

IF you have valuable solids being lost with liquid wastes, use this fast, sanitary, economical method to salvage them. Link-Belt's liquid vibrating screens are used effectively by canners and packers the country over — for profitable waste reclaiming . . . for reducing stream pollution. Send today for Book 2377-A, containing full details.

13818-R

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7.

When inquiring check 8259 opposite last page



Magnetic "rails" under present or new lines provide

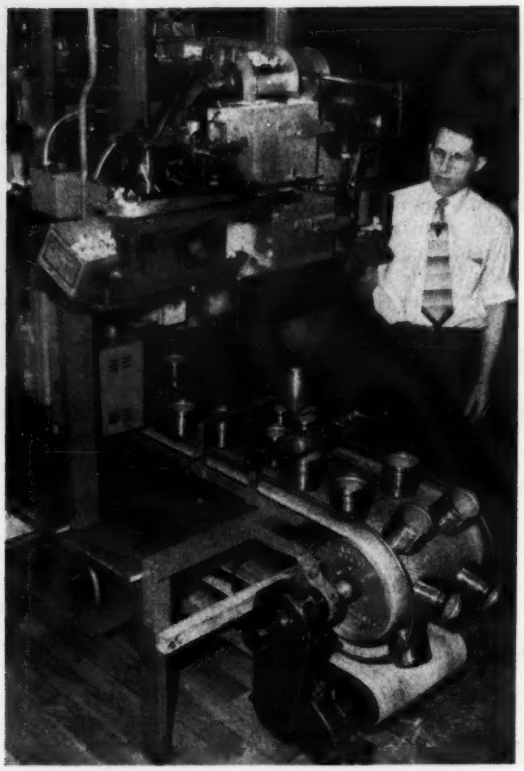
low-cost, efficient way to convert belts for magnetic conveying

Advantages of magnetic conveying are now easily incorporated into present or new conventional belt conveyor systems. This is accomplished by means of magnetic "rail" sections that install between belts of conveyor. The "rails" serve to hold non-electric magnetic castings. Hershey Chocolate Corp., Hershey, Pa., found them to be the answer to a handling problem encountered when a new package for chocolate kisses was adopted. This application provides a good example of the great flexibility of such converted systems. Pictures show how steel receptacles, filled with kisses, cling to belt when it is traveling at steady speed, is

Former package (left) with hand-taped and new type with crimp seal

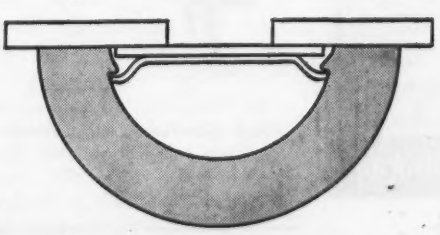
View, left, shows how receptacles, previously filled with chocolate kisses (see photo below), are elevated for dumping into packaging machine which delivers bags filled and sealed

Steel receptacles travel continuously on magnetic belt conveyors between weighing station and packaging machine. Raymond Phillippy, a supervisor of maintenance for Hershey Chocolate, checks operation



View shows placement of magnetic castings. Normally they are enclosed

Shaded portion indicates rail which holds magnetic elements. Rails can be installed on present belts or incorporated in new lines



elevated at a sharp angle, or turns over a pulley to dump kisses into packaging machine.

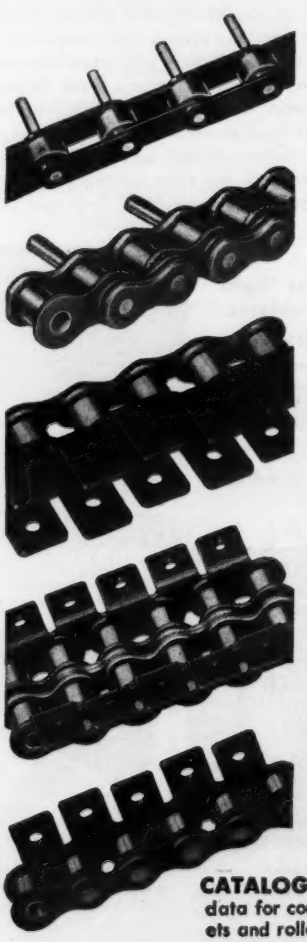
In the former packaging method, girls operated machines which weighed a precise amount of the kisses and filled them into bags. Other girls then taped the bags manually.

With the new system, an automatic machine forms bags from a roll of film, fills and closes them automatically. Units originally used for weigh-filling have been retained for weighing. In the new set-up the steel receptacles travel on a continuous magnetic belt conveyor system between weighing operation and packaging machine. The magnetic "rails" beneath the belt conveyor sections hold the receptacles securely yet permit movement on the belt. This facilitates their alignment at filling operation and is ad-

(*Turn to next page*)

good answers

to Conveying, Sorting, Packaging, Handling, Timing Problems



• Standard Diamond Roller Chain is available in pitches from ¼" to 2½" with pins extending every pitch, every second pitch or as required. Double pitch chain with standard or large rollers for rolling over flat surfaces (illustrated) can be furnished with pins extending as desired.

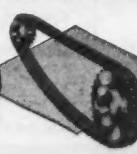
• Double bent attachments can be furnished one side, or both sides of chain every link, or spaced as required for your particular operation.

• Bent attachments both sides of double strand Diamond Roller Chain provide excellent carrying capacity and improved stability for heavier products or materials which may have unequal weight distribution.

• Straight attachments every pitch for mounting fixtures, parallel cross members or other conveyor accessories. Straight attachments can be ordered spaced as required and on one or both sides of chain.

CATALOG 757 contains engineering data for correct selection of stock sprockets and roller chain. Write for your copy.

DIAMOND CHAIN COMPANY, Inc.
Where High Quality is Traditional
Dept. 410, 402 Kentucky Avenue, Indianapolis 7, Indiana
Offices and Distributors in All Principal Cities
Please refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND  ROLLER CHAINS

When inquiring check 8260 opposite last page

Another interesting Wendway installation. Twin flights of wide belt Wendway operate continuously between production stations to convey air filters to inspection stations.

Here's what WENDWAY can do for You!

Wendway can be your "silent partner" by conveying any light products weighing 20 lbs. or less, swiftly and silently from one operation to the next. Wendway conveying systems are completely sanitary . . . safe for operators, too! Wendway will carry your products overhead, through walls, upstairs or down—to any place you want them. Wendway will eliminate wasted manpower, unnecessary handling and boost production all along the line. Standardized powered straight sections, curves, switches, etc., are operated by remote control and easily adjusted to required speeds. Wendway will smooth out your assembly processing, packing or inspection problems and pay for itself in time and equipment saved.

Remember . . .

- **Wendway answers your 'light product' conveying problems.**
- **Wendway complies with even the most rigid sanitation codes.**
- **Wendway synchronizes perfectly with other production line equipment.**
- **Wendway increases production line profits.**

Wendway belting will not damage even the most delicate of products. Automatic conveying assures products of cleaner, fresher, neater appearance.

Overhead cooling for cooked or heated products saves you time and floor space. Wendway takes 'em up, cools 'em off and brings them down—automatically!

Cartons, fragile packages, etc., are completely safe on Wendway. Smooth, silent travel delivers products in perfect shape, clean and fresh in appearance.

Write today for additional information, literature and specifications to match your conveying requirements.

Gentlemen:
Please have your area distributor contact me at once.

Name _____ *Title* _____

Company _____

Address _____

City _____ *Zone* ___ *State* _____

The product to be conveyed is _____

UNION STEEL PRODUCTS CO., Albion, Michigan

When inquiring check 8261 opposite last page

material handling

Magnetic Conveying

(*Continued from page 73*)

vantageous should it be necessary to momentarily stop filling machines.

End of one section of conveyor is elevated above packaging machine and as receptacles reach this point, they turn around a pulley, dumping contents. This pulley, as well, and a similar one at weighing unit (see photo), are magnetic. Thus, maintenance of magnetic pull is retained at these points.

The "rails" are specially designed circuits of continuous steel plates with powerful Alnico V magnetic castings spaced on a 16-gage stainless steel connecting strip. They are only 4" wide, 1-15/16" high and made in standard lengths of 3,4,5 and 6'.

The new magnetic conveying system has aided production and overall efficiency, precise weighing has been maintained with former units utilized. Package itself is more practical, more attractive with better closure and easier to handle. ("Magna-rails" are a development of Eriez Mfg. Co., Dept. FP, 13 Magnet Drive, Erie 6, Pa. . . . or check 8262 on convenient Reader Service slip opposite last page.)

"Poor fella twenty minutes without a coffee break . . .!"

Have you changed your address recently?

● If so, you'll want to insure that your copy of FOOD PROCESSING reaches you without interruption. Just send us your new address . . . use the convenient form below.

Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

mail this request to
READER SERVICE DEPT.
FOOD PROCESSING

111 East Delaware Place
Chicago 11, Illinois

Former Company Affiliation .....

Former Address .....

Your Name ..... Present Title .....

Present Company .....

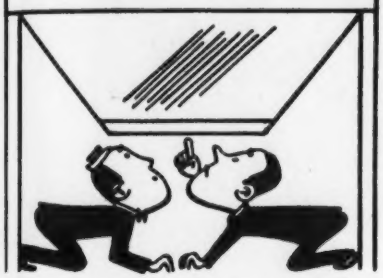
Main Product .....

Rating of Company .....

Street Address .....

City ..... Zone No. ..... State .....

. . . . . That's where the trouble is!



"What do you recommend?" asked the candy manufacturer. We recommended a Type F Cleveland Vibrator, and now his nut meat bins are no longer a production bottleneck.

Many food processors have found Cleveland Bin Vibrators an economical solution to their bulk handling problems. And your employees will appreciate the new silent vibrators that do the job without a murmur.

Tell us about your particular stymie, or ask for our detailed literature. We're sure there's a CLEVELAND to fit your requirements.

AIR *and* ELECTRIC

Bin Stuck Lately?

THE CLEVELAND VIBRATOR COMPANY

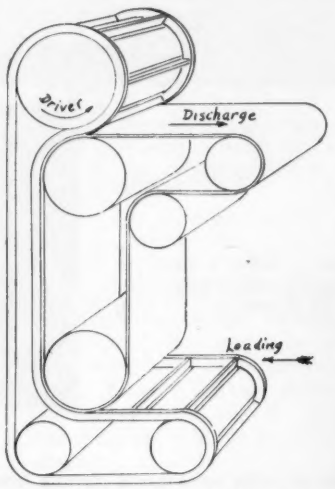
2818 Clinton Ave. • Cleveland 13, Ohio

When inquiring check 8263 opposite last page

Lift loads vertically with easily made flanged belt assembly

Grains, dried fruit, beans typical of foods handled

A simple and effective lift unit can be made by vulcanizing cleats to belts, incorporating rubber flanges with hollow core. Rubber cleats can be placed at any spacing desired. In assemblies like that illustrated, belt has flanges 1" high, while cleats are also 1"



Flanges and cleats 1" high enable belt to lift peas

high on 6" spacings. This allows use of relatively small pulleys, in this instance 6" diam, along with larger pulleys of 10" diameter.

Amount of material handled varies with product. However, a 12" width belt with cleats and flanges as previously specified can deliver 7¼ tons of peas per hour with belt speed being about 70 fpm. Amount delivered could be increased by using wider belt. (They are available in up to 4' widths). Power requirements are little. Hugger belt, which rides against face of cleated and flanged belt (see sketch), is driven entirely by contact.

(Flanged and cleated belt vertical lifts are available from Dura-Belting Mfg. Co., Inc., Dept. FP, 3741 Broadway, Oakland 11, Calif. . . . or check 8264 opposite last page.)

do you move products like Romans built the Tower of Pisa... by hand?

READING TIME 15 SECONDS

The Leaning Tower of Pisa is quite a curiosity. But as an engineering feat it's a mess!

When companies turn to automation to increase their profits in today's competitive markets they call on the best conveyor engineers—Lamson engineers.

The automatic systems illustrated not only look good, but pile up dividends.

(WATKINS GLEN, N. Y.) This new *low-cost* Model G Automatic Pallet Loader is speeding shipments while improving working conditions, and has reduced production costs in this highly competitive market.

LAMSON

LAMSON CORPORATION
253 Lamson St., Syracuse 1, N. Y.
Plants in Syracuse and San Francisco
Offices in Principal Cities

Please Clip to Your Letterhead

- ☐ Have an engineer call me for an appointment
- Send me these bulletins:
- ☐ "Conveyor Facts"
- ☐ 28-page Roller Gravity Bulletin
- ☐ "Model G Automatic Pallet Loader"

253

When inquiring check 8265 opposite last page

VERTICAL... HORIZONTAL... OR INCLINED Conveying

Screw-Lift — Screw-Veyor

PATENTED AND TRADE MARK REG. U. S. PAT. OFF. PATENTED AND TRADE MARK REG. U. S. PAT. OFF.

HERE'S engineering leadership that pays dividends the minute you install it — a conveying system that needs no return legs — delivers free-flowing bulk material wherever you want it — reclaims it where necessary — *and doesn't need anyone to run it!*

Screw operates within a tube. System is dust-tight, moisture-proof, *handles materials gently — no degradation.* Cleanliness too, is a feature — there's no place for material to build up and become rancid.

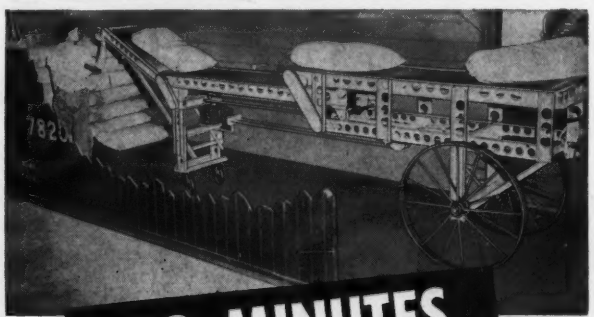
Exclusive features preclude the possibility of clogging at the juncture of the horizontal and vertical units. Conveyor Screws work in unison. Any section can be removed without disturbing the other.

You'll be amazed at the many possibilities a system like this offers — saving space and reducing expenditures for alterations.

Learn about Screw-Lift — Screw-Veyor before making commitments. Write for Bulletins M-500-2 and M-600-2.

Three of the largest feed processing plants in the U. S. A. have over 100 Screw-Lifts in continuous operation
Screw Conveyor Corporation
HAMMOND
ENGINEERS
MANUFACTURERS

When inquiring check 8266 opposite last page



59 MINUTES

. . . time enough to load a box car!

Our new improved sack loader enables you to load box cars in record time . . *59 minutes by actual count!* Now, with *one man doing the work of six* both time and money are saved through the elimination of trucking, carrying and lifting. Let us know your needs and one of our representatives will be glad to call. New brochure available on request.

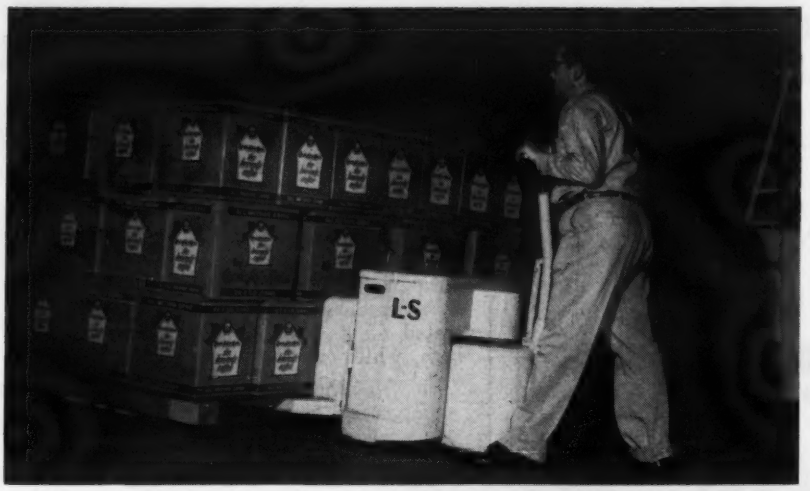
Loaders are of aluminum construction for strength and light weight. Here 100 lb. sacks of feed are turned by conveyor belt as they come on to loader from delivery chute.

Ottumwa

BOX CAR LOADER COMPANY

D-100 OTTUMWA, IOWA

When inquiring check 8267 opposite last page



(A) Walkie trucks quickly load coffee on 62 x 72" pallets tailored to width of highway trailers

(B) After casing coffee is picked up by rider truck for ceiling height tiering in storage

Mounting volume of coffee sales meant storage, handling-problems. We mechanized our methods to save space, labor and

speed in-coming-outgoing shipments on extra-wide pallets

W. O. BOUCHELLE, Vice-President,
Chock Full O'Nuts Coffee Corp.
as reported by **FP staff**

Use of extra-wide pallets for both in-coming and outgoing shipments, is just one of many ideas adopted by "Chock Full O'Nuts Coffee Co., Brooklyn, N. Y., to keep pace with growing volume and expanding distribution. Some 500,000 lb. of merchandise is handled daily. Pallets, tailored to widths of the company highway trailers, comprise a total load of 2750 lb. Mechanized handling has increased storage-space one-third, through stacking pallets to ceiling heights. It saves about 32 manhours a day in both green coffee and shipping departments.

Three different trucks are used. Two are rider-type. First of these, is especially suited for handling pallets in tiered storage. It transports pallets weighing to 3000 lb and climbs a 10% grade with such a load. The second truck, also a rider-type, picks up palletized loads as they are assembled at end of conveyor (see photo "B") bringing cases from packaging section. Third truck, a "jacklift" unit, is used largely in loading highway trailers as it is only 32" wide and maneuvers easily in cramped quarters.

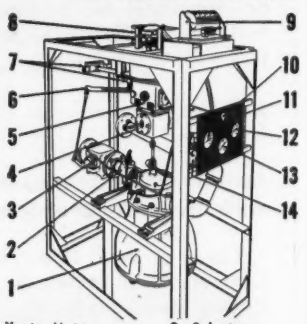
(Rider and jack-lift trucks for wide pallet handling are built by Lewis-Shepard Products Inc., Dept. FP, 192 Walnut St. Watertown, Mass. . . . or check 8268 on form opposite last page.)

Blends many liquids automatically with unexcelled accuracy

Bowser precision proportioners automatically and accurately blend two or more liquids in closed, continuous production.

A simple setting of the percentage selectors provides any variation of blend from ½% to 100%. XACTO, "the world's most widely used meter," assures perfect proportioning of all liquids being mixed, compounded or blended.

SIMPLICITY OF DESIGN SAVES SPACE . . . REDUCES MAINTENANCE



1. Xacto Meter
2. Thermometer Well
3. Inlet Control Valve
4. Differential
5. Control Nut
6. Valve Control Arm
7. Pump Control Circuit & Switch
8. Selector
9. Indicating & Totalizing Dial
10. Flow Indicator
11. Inlet Pressure Gauge
12. Discharge Pressure Gauge
13. Dial Thermometer
14. Discharge Check Valve

DIALS FOR EVERY PURPOSE

Model K—furnishes printed record of quantity dispensed or received for accounting; Model P—delivers predetermined quantities up to 10,000 gallons; Model RP — delivers predetermined quantities, repeating each quantity automatically.

FREE OFFER . . .

Write for full color, 12-page Facts Folder titled, "XACTO PRECISION BLENDING SYSTEM."

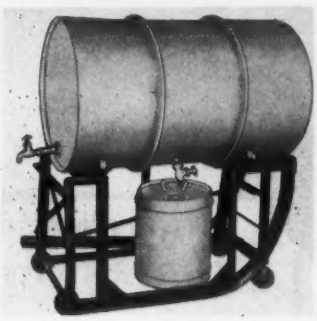
BOWSER INC.
1304 E. CREIGHTON AVE.
FORT WAYNE, INDIANA

When inquiring check 8269 opposite last page

Drain truck's long WB means safe operation

Retractive caster frame swings inside rockers

Retracting caster frame gives truck wide, safe, wheelbase. Frame swings inside rockers while drum is being loaded. Truck is then thrown forward by pressure on foot lever, placing casters in front of truck. Safety catch is located on nosepiece to prevent drum from slipping during loading. Wheels are 3" diameter. Truck is finished in red enamel.



Drums can be dispensed from end or side

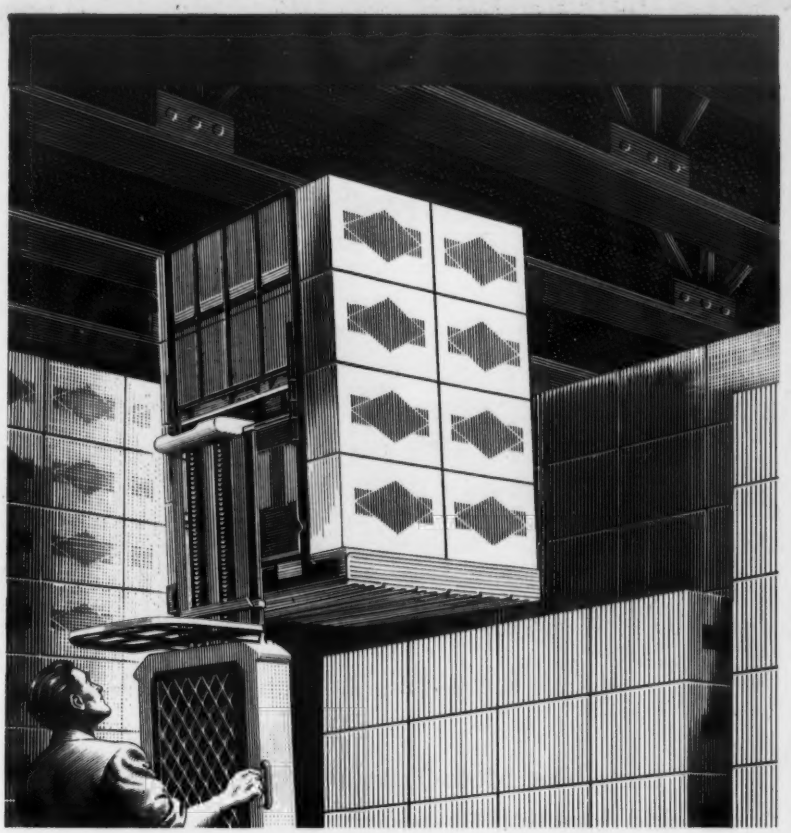
(No. 55-0 drum truck is built by Morse Mfg. Co. Inc., Dept. FP, 727 W. Manlius St., E. Syracuse, N. Y. . . . or check 8270 on form which is located opposite last page.)

Cleats easily affixed to belts to aid elevation of materials

Features: Easily affixed in a few minutes.

Description: Can be applied at 90° (across belt) in the form of chevrons or "V's" along side of belt to act as guide rails or in any pattern desired. Available in heights of 7/16, ¾, 1 and 1½" — all in 36" lengths.

(Rema cleats are available from Flexible Steel Lacing Co., Dept. FP, 4607 Lexington St., Chicago 44, Ill. . . . or for more information check 8271 on form which is located opposite last page.)



MAKE USE OF YOUR AIR RIGHTS...

Open space under your warehouse roof may be clear profit... if you can utilize it by stacking boxes taller. But, before you do, be sure your boxes will stand straight and strong under the increased load. Gaylord containers have this valuable "stack-ability" because they are precision built of the finest quality materials.

For information on containers to help you make full use of all your storage space, call your nearby Gaylord office.

Gaylord Boxes

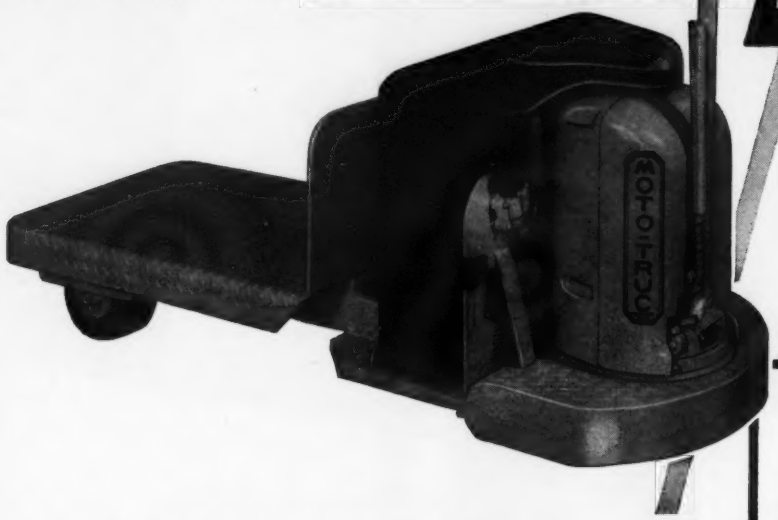
CORRUGATED AND SOLID FIBRE BOXES
FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION • ST. LOUIS

When inquiring check 8272 opposite last page

MOTO-TRUC
Low Lift Platform Truck

...Simple Construction ...Rugged Performance



You can't beat Moto-Truc low lift platform trucks for skid handling efficiency. They're small enough to maneuver in the tightest spots, yet tough enough for outstanding performance on your roughest handling job.

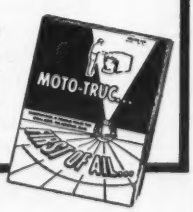
Simplicity is the key to Moto-Truc performance. The powerful gear drive unit-exclusive internal expanding brakes-patented "Roller Grip" travel control--all are among the features that guarantee lower operating costs, less maintenance and greater dependability.

The standard platform truck, model MTP, is only 24" longer than your load while the extra short model MTP-SC adds only 17" to the load length. Both are built in 4,000, 6,000 and 10,000 pound capacity with a wide range of platform sizes.

A LOOK UNDERNEATH

See how Moto-Truc Platform Trucks use simple construction to insure rugged performance? For example, these two service proven features— Load wheels are supported on both sides to take a pounding from rough floors and heavy loads. Lift hinges run all the way across the platform for maximum load support and reduced maintenance.

Write Today For Bulletin 56W. Get detailed specifications on all Moto-Truc's low lift platform trucks.



Builders Of The First Walkie Truck

MOTO-TRUC Standard for the Industry PATENTED

The MOTO-TRUC Co.

Representatives in Principal Cities

1988 E. 59th St. Cleveland 3, Ohio

Pallet . . . Platform . . . Hi-Lift Truck

When inquiring check 8273 opposite last page

Flatten bags by vibration, no product breakdown

Low hp — low working stress contribute to low maintenance and operating costs

Uses: For flattening bottom-heavy bags of loose, bulk material.

Features: Flattening achieved with no product breakdown. No belts to replace or adjust.

Description: Bag flatteners are available in standard models, either fixed or mobile. All operate on natural-frequency principle. Bags are tossed upward and forward gently with each movement of trough. Flattening is achieved almost immediately as material inside bag conveys more quickly than the bag itself.

(Vibrating bag flatteners are built by The Carrier Conveyor Corp., Dept. FP, 198 N. Jackson St., Louisville, Ky. . . . or check 8274 on the convenient Reader Service slip opposite last page.)

Synchronizing conveyor with lift truck saves space

Cases of olives in unit loads moves from sealer to shipping continuously

Nice timing of lift truck and conveyor operation permits loading out large volumes of shipments in proportion to space available in plant of San Francisco olive packer.

Cases of olives leaving sealer are loaded on immediately adjacent pallets, which are

Pallet loads delivered by conveyor are doubled for quick transfer to storage area

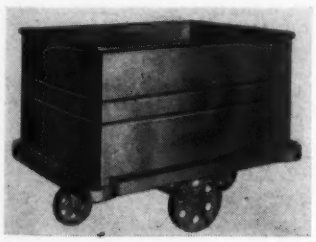
spotted on end of 10′ conveyor. As each pallet is filled it moves along to make way for an empty. Conveyor has capacity of only four pallets, but provides enough of an accumulation so that truck can load out shipments without delaying palletization of sealed cases. Olives destined for storage are handled at intervals in double pallet loads.

Cycle of an olive from receiving through packing and to shipment is 10 to 12 days. Conveyor-truck-system is just one phase of revamping under direction of Arthur Bell, president of Bell Packing Co., to speed up operation.

(Compact lift truck is built by Lamson Mobilift Corp., Dept. FP, Syracuse 1, N. Y. . . . or check 8275 on form opposite last page.)

Bin-type floor trucks available in stainless steel or aluminum

Bin-type floor trucks are available in stainless steel, galvanized steel, or aluminum to provide following features: will not rust, corrode, or absorb moisture or odors.



Truck has rolled edges, bumpers, drain bottom

Especially serviceable of the wide size selection is model 48″ long; 36″ wide and 24″ deep.

Bumpers are included front and rear. Center wheels are 12″ diameter with roller bearings. Rigid end wheels are 8″ diameter. Corrugated drain bottom is optional.

(Non-corrosive floor trucks are built by Lewis Shepard Products Co., Inc., Dept. FP, Watertown, Mass. . . . or check 8276 opposite last page.)

REX®

TABLETOP®
CONVEYOR CHAIN
. . . the standard of comparison

All flat-top conveyor chains are compared sooner or later with the grand old work horse of the food and beverage processing industries—the original Rex TableTop Chain. More cans, bottles, jars and cartons travel on Rex TableTop than on all other flat-top chains combined. New chains may come and go, but Rex TableTop keeps on running and running and running.

The performance of the popular steel and stainless models of Rex TableTop has earned this position of dominance. It is now also available in Nylon—for special dry-run applications where lubricant cannot be tolerated. The Nylon chain is even more smoothly continuous in its configuration, and its operation is exceptionally quiet.

There's a bulletin just off the press on Rex TableTop and other Rex Conveyor Chains for the efficient handling of bottles, cans, jars, food, metal parts, components, packages, cartons and boxes. Write today for Bulletin 56-60. CHAIN Belt Co., 4699 West Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT COMPANY
Milwaukee 1, Wisconsin

When inquiring, check 8277 opposite last page

New Package-Imprinting Attachment

makes accurately-located, high-quality imprints on side of cases, crates, cans, etc.

Model "750" ROLAPRINTER machine . . . imprints contents identifications, other legends on side surface of set-up cartons and cases, rectangular metal cans, wood crates, wire or strap-bound bundles, etc. Attaches to conveyor, case-sealer, other production equipment. Not just another "marker" but a precision imprinter that gives "printing-press" results. Also available for imprinting all 4 sides.

This new unit is fully automatic, operates by means of microswitch-activated electro-mechanism that registers imprints accurately; has built-in motor-driven flexographic printing system that synchronizes with surface speed of package. Uses fast-drying liquid ink of any color and rubber type or dies.

Write for Bulletin RIN-5.

Gottscho

ADOLPH GOTTSCHO, INC.

Dept. V, Hillside 5, N. J.

In Canada: **RICHARDSON AGENCIES, LTD., Toronto & Montreal**

Automatic Production-Line
CODING, MARKING IMPRINTING MACHINES

When inquiring check 8278 opposite last page

A modern truck for modern plants

The HydroLectric

with most modern features

- 2 Drive Wheels instead of one
- 2 Braking Systems available instead of one
- 4 Wheel Stability instead of three
- Alloy Gear Transmission instead of chains
- 100% more Steering Ease —Greater Maneuverability
- 50% less Maintenance —Easy Accessibility
- Finger-Tip Control —Greater Safety

Put these modern features to work for you, greater profit at no additional cost.

Write for Bulletin KP

STUEBING Designed • Engineered • Built

LIFT TRUCKS, INC. / CINCINNATI 14, OHIO

THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL.

When inquiring check 8279 opposite last page

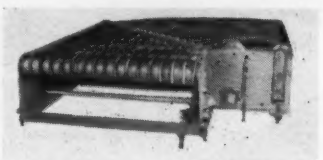
---

material handling

Mount parallel conveyors side-by-side without using radius turns

Transfers small as well as large objects

Features: Uses no rollers or deflectors but bases operation on a series of narrow belts running in grooved pulleys which in meeting provide angular direction of flow. Parallel conveying lines can be



Speed differential between banks of belts produces positive turning action

mounted side by side without need of space consuming radius turns, and converging conveyors can be fed into a single conveyor.

Description: Belts are banked for constant contact with the material in motion and positive belt guides prevent side sheer as the material changes direction. Slight differential in speed between bank of belts produces turning action. Small as well as long articles are carried efficiently.

(Stewart-Turns are made by Stewart-Glapat Corp., Dept. FP, 1639 Moxahala Ave., Zanesville, Ohio . . . or check 8280 opposite last page.)

EFFICIENT WASTE HANDLING

. . . has saved American Maize Co. of Roby, Ind. some $30,000 per year in labor alone. One man in a radio-equipped, pick-up truck is able to service entire 35 acre plant area, with help of special self-dumping containers at collection points. Story begins on page 34.

Batch or continuous

UNITIZED WEIGHING

easily installed...lower in cost

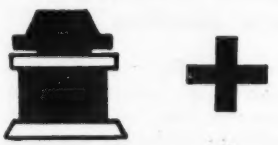
UNI-FORCE PLATFORM

. . . applies only vertical force components . . . assures full accuracy despite load placement or pile-up. No springs, knife edges or levers. Immune to side thrust.

WEIGHT TRANSDUCER

W-C Electrical Transducer can offer the broadest *net weight* output range . . . correspondingly higher accuracy.

W-C Pneumatic Transducer gives force-balance dependability . . . with independent tare adjustment. Unaffected by vibration. High sensitivity. Accuracy to 0.25% of range.



INSTRUMENTATION

Remote indication or fully automatic control of batch or continuous weighing . . . any material . . . any vessel or conveyor.

Write for descriptive literature.

W-C

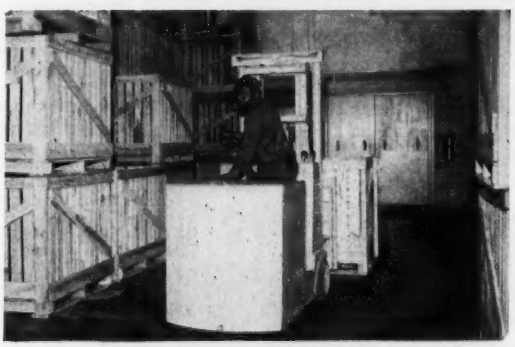
WEIGHING *and Control* COMPONENTS, Inc.

206-G Lincoln Ave., Hatboro, Pa.

When inquiring check 8281 opposite last page

L-S ELECTRICS FOR LIFT TRUCK SAVINGS

L-S Model "E" Electrics equipped with special 180° rotating attachment now dump 2000 lb. loads of raw potatoes directly into processing hopper. With this new bulk method, every L-S truck at H. W. Lay & Company handles up to 80 tons of potatoes a day!



Here, L-S electric fork lift stacks boxes four high to 20' . . . adds thousands of feet of storage space with less floor area! Box pallets each hold a ton of unbagged potatoes. Slatted sides allow air to circulate and reduce potato shrinkage.

Trailing high, bulky loads is simple and safe with L-S Electrics. Exclusive Standrive position gives operator greater freedom getting on and off . . . full visibility when traveling in forward or reverse.

For more information on product at right, specify 8282 see information request blank opposite last page.

SAVED: $160,000 in one year!

At H. W. Lay & Company, Atlanta, Ga. . . . project manager, Mr. H. C. Waggoner estimates, "The use of Lewis-Shepard trucks will save us at least $20,000 in labor alone over the hand and jack truck methods formerly used. This, added to savings in space, results in a total saving of $160,000 in our first year!"

Using four L-S Model "E" Electrics . . . Lay and Company now stores and handles potatoes by the bulk ton. Most important, these high-stacking lift trucks doubled overhead storage space . . . reclaimed over 20,000 sq. ft. of valuable floor area for productive use.

Lay's also chose L-S Electrics because fumes and food don't mix. The Model "E" is clean, silent . . . works without odors, smoke, oil or grease stains. What's more, compare gas vs. electric truck costs. For low-cost maintenance and full-time dependability . . . you'll choose L-S, too, because it's your best truck buy! Mail coupon for full information.

Here's a list of important companies that have recently reordered L-S Model "E" Electrics:

	Now in use	Reordered
Electrical Goods Mfg.	110	24
Overland Express	81	23
Office Supply Mfr.	17	2
Refrigeration Plant	10	4
Food Chain	3	7

L-S LEWIS-SHEPARD®
The most complete line of materials handling equipment anywhere

The "MASTER" Line **376 Walnut Street, Watertown 72, Mass.**

Please send me:
☐ L-S Model "E" Catalog #32-1 ☐ L-S MASTER Line Catalog ☐ L-S "Gas vs. Electric Cost Study"

Name ..... Title .....

Company .....

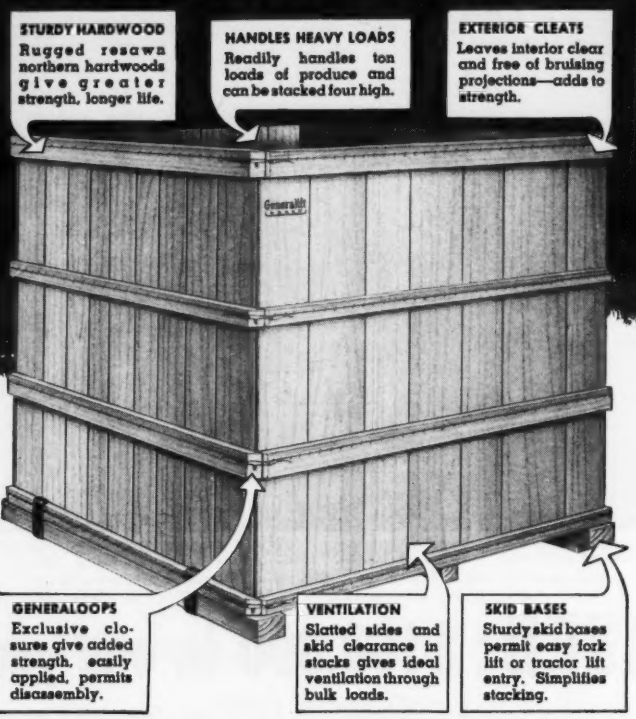
Address .....

City ..... State .....

Growers, Processors, Pre-Packers
Save Labor, Money—Improve Quality

Generalift WIREBOUND PALLET BOXES

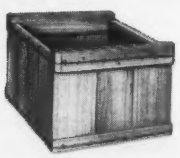
For Bulk Handling, Harvesting, Storing and Shipping Fruits and Vegetables


STURDY HARDWOOD
Rugged resawn northern hardwoods give greater strength, longer life.
HANDLES HEAVY LOADS
Readily handles ton loads of produce and can be stacked four high.
EXTERIOR CLEATS
Leaves interior clear and free of bruising projections—adds to strength.
GENERALOOPS
Exclusive closures give added strength, easily applied, permits disassembly.
VENTILATION
Slatted sides and skid clearance in stacks gives ideal ventilation through bulk loads.
SKID BASES
Sturdy skid bases permit easy fork lift or tractor lift entry. Simplifies stacking.

Generalift® pallet boxes are designed to save labor, time and money . . . help improve quality in the bulk handling of agricultural products. They're built to withstand the rigors of exposure, rough use, heavy loads and high stacking in storage.

They are widely used to harvest, handle, store and ship bulk loads of literally every fruit and vegetable with impressive records of service and savings. Initial investments are quickly recovered through pallet box economies.

Available in several standard types and sizes to fit every agricultural need.



LONG-LIFE, LOW-MAINTENANCE PICKING BOXES

Rugged wirebound construction and tough resawn hardwoods combine to make the sturdiest picking boxes available. Cut maintenance costs, get more service from your picking boxes. Available in 1 bushel and 1¼ bushel sizes. Stack securely, nest in storage.

518

General Box

Send for your copy of the Generalift Agricultural Catalog Today.

General Box Company
1863 Miner Street
Des Plaines, Illinois

material handling

Cover belt splices with rubber coating

Seal out moisture and provide smooth surface

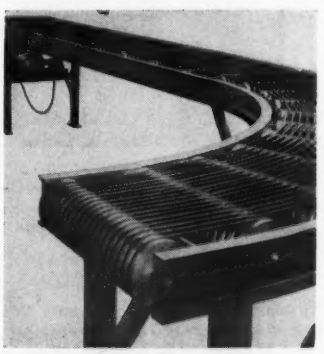
Belt splice fastener offers self-vulcanizing rubber repair material for protection. In one method of application the special fasteners are recessed in the belt and then covered with special surface strips. This provides a smooth belt surface desirable where scrapers are used. Both top and bottom of belts can be protected in this manner.

In a second method both ends of belt are sealed with sheeting before applying fasteners, aiding in minimizing deterioration of belt ends.

(REMA rubber repair material and filler sheeting are available from Flexible Steel Lacing Co., Dept. FP, 4607 Lexington St., Chicago 44, Ill. . . . or check 8283 on the convenient Reader Service slip opposite last page.)

Conveys packages, bags around corners

Features: Eliminates need for transferring stations since conveyor can be fitted around almost any of obstruction.



Curved sections are built in 18, 24, 32" widths

Description: Curved, powered conveying surface consists of steel spring belts on 1¼" centers, running over grooved rollers. Units can be built to make S- or U-turns to a 5-ft radius.

Magcoa / Tobey aluminum Trucks

and easy to keep clean!

- Non-toxic, odorless, stain-free construction
- Exclusive casters— **fully guaranteed**
- Bright, easy-to-clean aluminum
- No painting or special finish required
- Easier to push and steer
- Riveted, flexible bed construction
- Available in many styles and types

For full details use the coupon below.

MAGNESIUM COMPANY OF AMERICA TOBEY ALUMINUM DIV.
magcoa TRADE MARK
East Chicago 26, Indiana
Representatives in principal cities

☐ Please send Magcoa/Tobey Data File

Name and Title_____

Company_____

Address_____

City-Zone-State_____

Copyright, 1957, Magnesium Company of America

When inquiring check 8284 opposite last page

Standard widths are 18, 24, and 32". Available is flexible curve which will deliver to left or right and which can be raised or lowered while running. This unit can also be hinged or furnished with gate openings at any point.

(Curved conveyors are manufactured by Power-Curve Conveyor Co., Dept. FP, 2185 S. Jason St., Denver 2, Colo. Check 8285 opp. last page.)

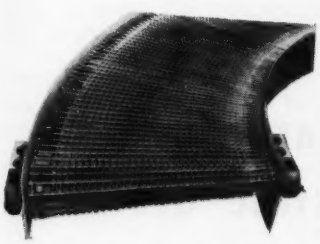
Nylon rails give longer life to conveyor turns

Special edge design prevents stretching and track-jumping on unit

Uses: Designed to move light or heavy loads around tight corners and from floor to floor, while maintaining product alignment.

Features: Nylon rails provide smoother, more quiet running, and assure longer equipment life. Special belt-edge design prevents stretching or track-jumping.

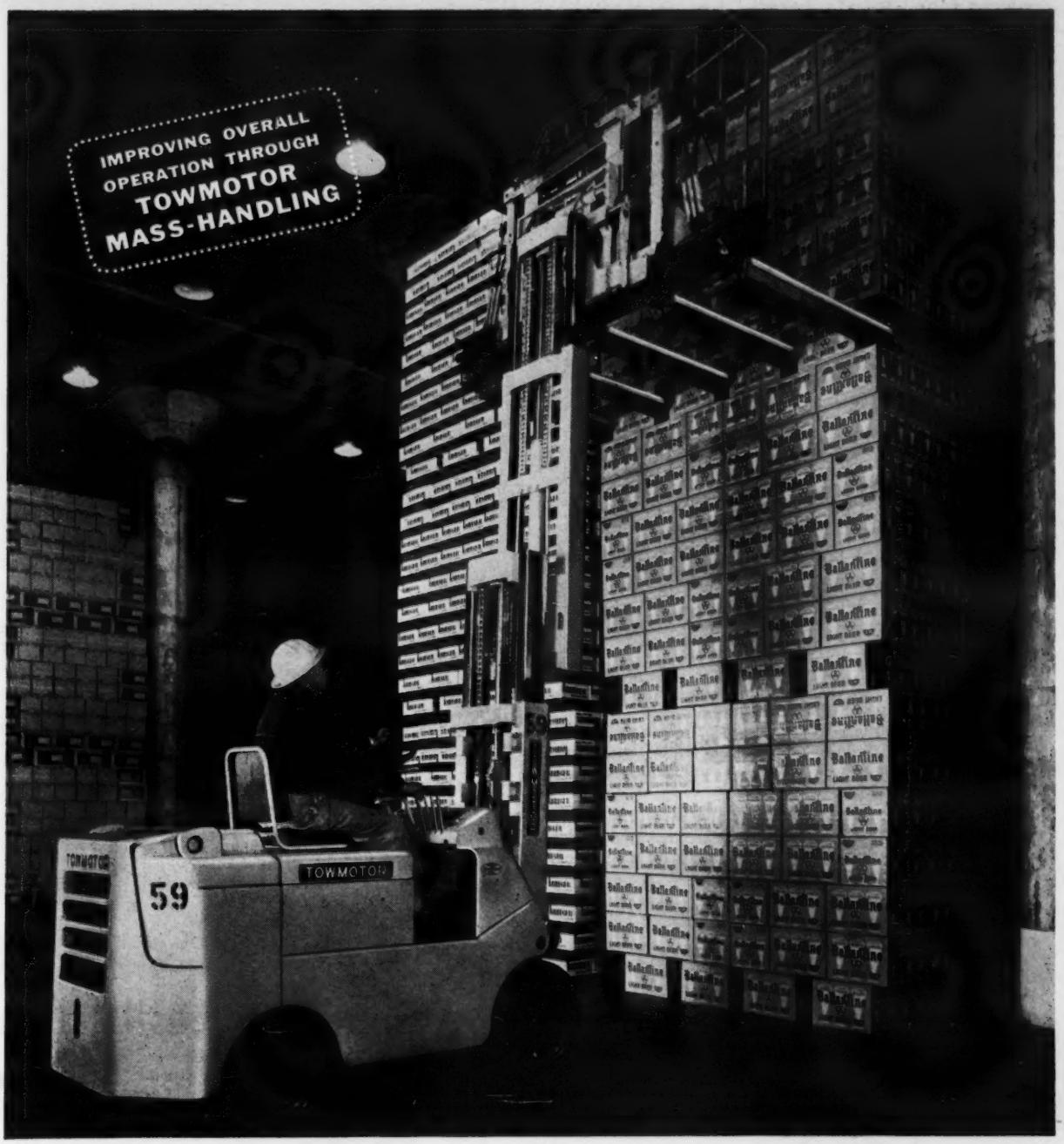
Description: Channel-weave mesh belt can be supplied in variety of steels and alloys,



Power turns with nylon rails are available in any degree of turn from 30° to 180°

and in widths from 12 to 48". Units are available with 24 or 30" outside radius, in any degree of turn from 30 to 180°, and with fixed or variable speed, up to 100 fpm. Units can be floor-mounted or hung from ceiling.

(Meshlok conveyor power turns are manufactured by Voss Belting and Specialty Co., Dept. FP, 5645 N. Ravenswood Ave., Chicago 26, Ill. Check 8286 on form opposite last page.)



...increasing productivity without adding personnel!

Management men in every industry are giving productivity and profits—*as well as personnel*—a lift by integrating Towmotor mass-handling in all operations from receiving to delivery.

Every department benefits. More work gets done. And you don't need more men to do it because Towmotor fork lift truck operators are finding it's *fun* to multiply the handling of materials aided by 12 new Towmotor improvements like these:

- New functional body styling
- New pace-setting comfort features
- New "tight-spot" maneuverability
- New centralized easy-reach controls
- New positive-response hydraulic lift
- Towmotor-improved power steering

Some of the industry's most significant advances in fork lift truck design and performance are shown in Towmotor's latest bulletin #SP-23. See how they help supplement your personnel—permit your men to do a bigger day's work easier—give each operator the power to improve your plant's productivity and profits.

Write Towmotor Corporation, Cleveland 10, Ohio. We'll send the illustrated booklet immediately.

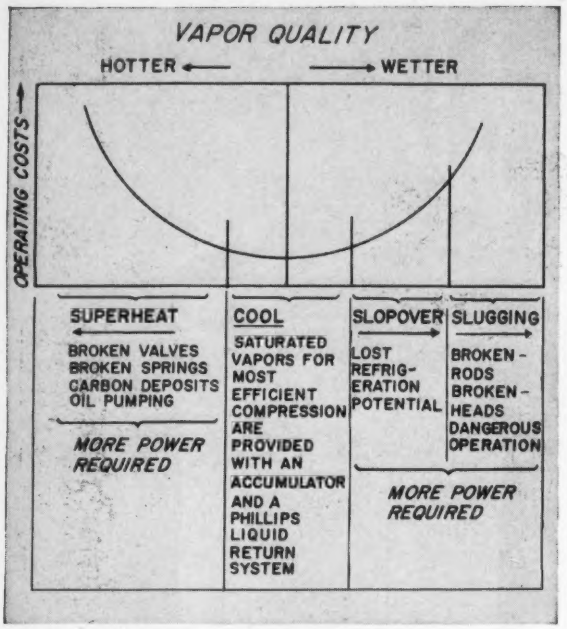
Leaders for 38 years in building Fork Lift Trucks and Tractors

TOWMOTOR — THE ONE MAN GANG — GERLINGER

Gerlinger Carrier Company, Dallas, Oregon is a subsidiary of Towmotor Corporation, Cleveland, Ohio

When inquiring check 8287 opposite last page

Liquid Ammonia Return Systems are Refrigeration's Preventive Insurance



Insurance at its best is insurance that *prevents* disaster. It's a much better buy than insurance which merely foots the bills while you get back in production after accidents. Phillips liquid ammonia return systems, which safeguard compressors against gulps of incompressible liquid ammonia, provide this sort of "insurance"— and it is quickly "paid up for life."

But liquid return systems are not in competition with insurance; in fact, many such systems are installed at the insistence of alert insurors who know a hazard when they see one.

Safety is a clear-cut reason for installing liquid return systems, but it is only one of several equally compelling reasons (see "VAPOR QUALITY" chart). *Economy of compressor operation* makes even more sense to the optimist ("It's a good compressor... How Can A Little Frost Hurt It?"). Cycling liquid ammonia through the compressor, even if it does not cause immediate damage, increases the power requirements and reduces the refrigerating effect produced. Liquid return systems by-pass liquid ammonia around the compressor and put it back where it belongs — in the evaporator. Here it can boost maximum or peak capacity of the entire system, it can raise cycle efficiency, and it permits full flooding of the evaporator coils without endangering the compressor.

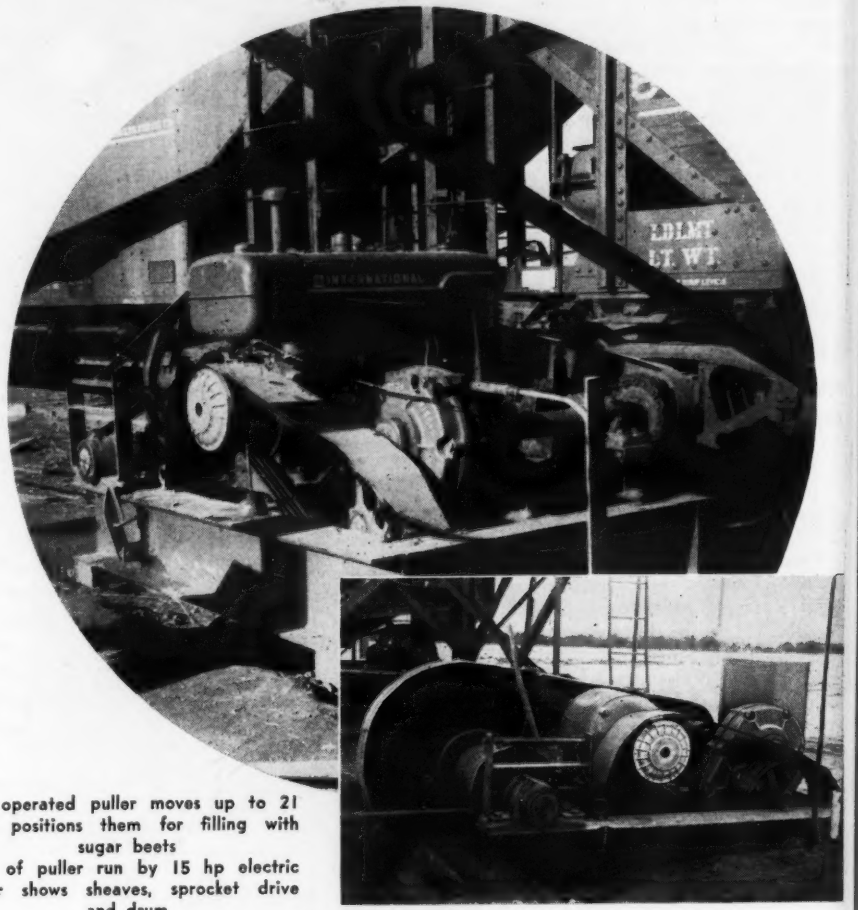
Phillips liquid return systems are ruggedly built of top-quality materials, in many configurations and sizes, for a wide variety of custom-engineered installations. You will find it a simple matter to select and add the right Phillips system to your refrigeration cycle. You can make a good start in this direction by writing direct to the manufacturer for a more complete engineering discussion of liquid return systems. We give all inquiries prompt attention.

SEND FOR BULLETIN LRS-56 — TODAY!

PHILLIPS

H. A. PHILLIPS & CO.
DESIGNERS AND ENGINEERS
REFRIGERATION CONTROL SYSTEMS
3255 W. Carroll Ave. • Chicago 24, Illinois

When inquiring check 8288 opposite last page



Gas operated puller moves up to 21 cars, positions them for filling with sugar beets
View of puller run by 15 hp electric motor shows sheaves, sprocket drive and drum

Spot cars easily at exact position when puller has flexible drive

Compensates for elasticity of cable — prevents cars being pulled past sugar beet loading points

In loading beets at the Toppenish, Wash. facilities of Utah-Idaho Sugar Co. cars must be moved to an exact position. Farmers bring in beets on side-dump-trucks to loading stations. Beets are weighed, then emptied into hoppers and moved on belt conveyors into the cars. In moving cars it is necessary to set brakes on some so that elasticity of puller cable does not pull a car beyond loading point. This creates a heavy load.

Wherever plug-in is available, electric pullers, powered by 15 hp (1160 rpm) normal torque motors are generally used. In some instances several types of car movers are used but all are of same basic design. On the output shaft of this motor is a special drive dry fluid unit. It is fitted with a 5 groove B section 18.4" pitch diameter v-belt sheave, which is mounted on input shaft of a 7" torque arm reducer. The torque arm reducer is mounted on a counter shaft which is supported by two

The "dry fluid" is heat treated

The "dry fluid" is heat treated steel shot. A measured amount called the flow charge, is contained in the housing which is keyed to the motor shaft. When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing and the rotor which transmits power to the load.

After a momentary slip between housing and rotor the two become locked together and achieve full load speed without slip.

angle journal bearings. On the opposite end of this shaft, which has a speed of approximately 41 rpm, is mounted a roller chain sprocket. This in turn drives to another sprocket which connects to final drum shaft. Rotation of this shaft provides a pulling speed for cars of 23 fpm.

Where there is no electric power, operation is by 25 hp gasoline engine. Engine runs continuously and idles at a speed of about 170 rpm, during which time the drive unit is on full slip. Operator in control house, about 30′ away, can throttle the engine by means of an airplane cable running through a conduit. Load is picked up through the drive unit. Drive housing dissipates sufficiently.

These car pullers move a maximum load of 21 cars at a time, each movement being about 10′ under the loading conveyor.

The smooth start provided by the dry fluid drive eliminates jerk on cable. This solves problem of heavy load caused by brakes being partially set. Weather changes do not affect starting of drives.

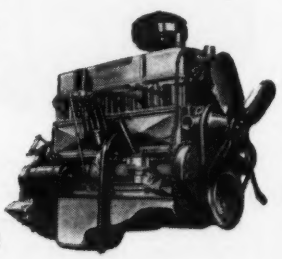
(Flexidyne drives, torque-arm speed reducers, taper-lock sheaves, reducers are made by Dodge Mfg. Co., Dept. FP, Mishawaka, Ind.... or check 8289 on form opposite last page.)

POWERFUL REASONS WHY A CHEVROLET STAYS ON THE JOB...SAVES ON THE JOB!

FAMOUS CHEVY 6

(America's most popular truck engine)

- Fuel-saving 8 to 1 compression ratio
- Low-maintenance valve-in-head design
- Two fuel filters for dependability
- Durable alloy steel exhaust valves
- High power-output ignition
- Economical by-pass cooling



Chevrolet trucks offer the world's most popular truck engines—big 6's, designed soundly yet simply to provide plenty of power at lowest cost and the ability to keep going in rugged service. Like all Chevrolet truck components, these engines put the accent on economy and dependability!

Chevy's the dollar saver *de luxe* of the American road, and many of the reasons why can be found beneath the Chevrolet truck hood. That's where you'll often find one of the great 6-cylinder powerplants that have pulled more payload more miles than any other engines in the history of hauling. They're honest-to-goodness *truck* engines, specially built to *stay* and *save* on the roughest and toughest of hauling jobs. Or, if you prefer a V8, the ones that hum beneath the Chevy hood are at the head of their class for fleet-going short-stroke V8 efficiency.

You'll find that a Chevrolet truck gives you *so much* to save with! Your Chevrolet dealer is waiting to fill you in on all the facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Biggest sellers . . . because they're biggest savers! CHEVROLET

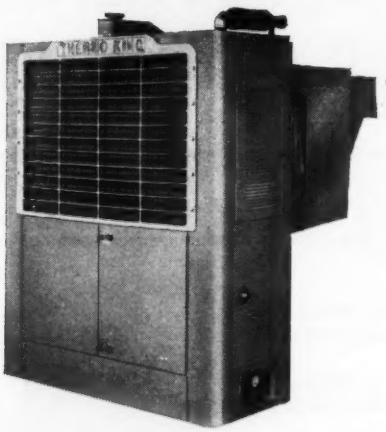
CHEVROLET TASK·FORCE 57 TRUCKS

When inquiring check 8291 opposite last page

perfect measurements

THERMO KING

delivers more refrigeration in less space



Here's why: Thermo King's newer, slim design fits the new trend in truck-trailer design—taking up less space between cab and trailer. It fits up in the nose of your trailer, taking almost no payload space. And it is engineered small and compact, to deliver more cooling for its weight and size than any other type of refrigeration on the market. Save space, refrigerate with **THERMO KING.**

NATIONWIDE SERVICE: Thermo King service stations on all important truck routes in United States, Canada and Mexico

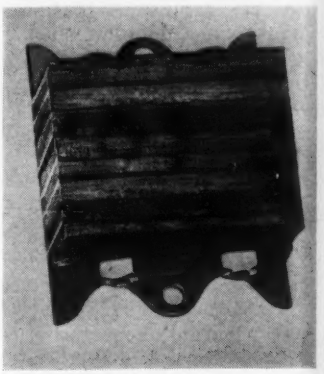
THERMO KING CORP., 44 S. 12th ST., MINNEAPOLIS 3, MINN.

When inquiring check 8292 opposite last page

Rubber-coated bumpers protect trucks, loads

Uses: For mounting anywhere on truck body to prevent damage to trucks, buildings and loads.

Features: Rubber-coated fabric used in construction allows for reversing so that life of bumper can be doubled.



Bumpers mount anywhere on truck body

Description: Bumpers are made in three styles, specifically designed for truck bed platforms and ICC frames.

(Flex-O-Rubber truck bumpers are available from Bumpers, Inc., 2534 Detroit Ave., Cleveland 13, Ohio . . . . or check 8293 on form opposite last page.)

"If you carry 'Blue Cross' wiggle your nose"

Pneumatic unloading makes exact spotting of cars unnecessary

Nozzle-hose assembly can reach far into carrier

Rapid unloading of dry materials from boxcars is provided by a new system which uses negative pressure. A feature of the system is location of centrifugal fan on opposite side of collector from the material conveying line so that product does not pass through the fan.

A light aluminum nozzle attaches to several lengths of hose to reach from interior of carrier being unloaded to permanent piping of the installation. This makes exact spotting of cars unnecessary.

Negative pressure is provided by horizontally mounted multi-stage fan. Collector is long cone type. System is available in range of sizes utilizing up to 75 hp.

(Pneu-Vac unloading system is built by Sprout, Waldron & Co., Inc., Dept. FP, Muncy, Pa. . . . or check 8294 on form opposite last page.)

Detergent diesel fuel cuts smoke

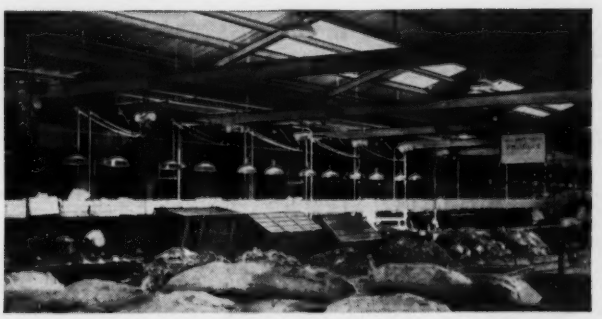
Prevents varnish and gum formation

Recently developed detergent-action diesel fuel is described as reducing fuel consumption, cutting smoke and increasing long-term engine power by keeping diesel injectors clean. Fuels have undergone road tests of over four million miles. Results showed that trucks using the fuels produced only half as much smoke after 60,000 miles as trucks operating with non-detergent fuels.

(Chevron diesel fuel and premium grade S.O. automotive diesel fuel are a development of California Research Corp., research wing of Standard Oil Company of California, Dept. FP, 225 Bush St., San Francisco, Calif. . . . or check 8295 opposite last page.)

Butler building combines offices, warehouse and loading area for fast, efficient storing and shipping of food products.

The Butler rigid frame provides unobstructed interiors. Stack your products from wall to wall, from floor to roof peaks.



Butler canning shed with horizontal steel beams added to support the electric hoists that carry produce to the conveyor.

Produce it...store it...ship it
more efficiently with **Butler** *buildings*

Butler buildings are spacious, functional—ideal for the efficient production, storage and shipping of food products. Butler's flexibility of usage provides you with low-cost field storage, safe, sanitary warehousing and efficient refrigerated storage. The spacious, post-free interiors give you a plant with complete freedom so you can arrange your production lines any length, any width for maximum efficiency.

Whether your Butler building is to be large or small, all metal or partially conventional building materials, it offers you these advantages: fast erection, easy, economical expansion . . . truss-free gables and post-free interiors up to 100 feet wide . . . fire-safe, wind-safe, vermin-proof . . . economical to heat, ventilate, illuminate and maintain.

For the full story on the Butler method of construction—the lowest cost way to build well—phone your Butler Builder. He's listed under "Buildings" in the Yellow Pages of your phone book. Or write direct.

BUTLER STEEL PRODUCTS

BUTLER MANUFACTURING COMPANY

7479 East 13th Street, Kansas City 26, Missouri

Manufacturers of Buildings • Oil Equipment • Farm Equipment • Dry Cleaners Equipment • Outdoor Advertising Equipment • Custom Fabrication

Sales offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Atlanta, Ga. • Minneapolis, Minn. • Chicago, Ill. • Detroit, Mich. • Cleveland, Ohio New York City and Syracuse, N.Y. • Washington, D.C. • Burlington, Ontario, Canada

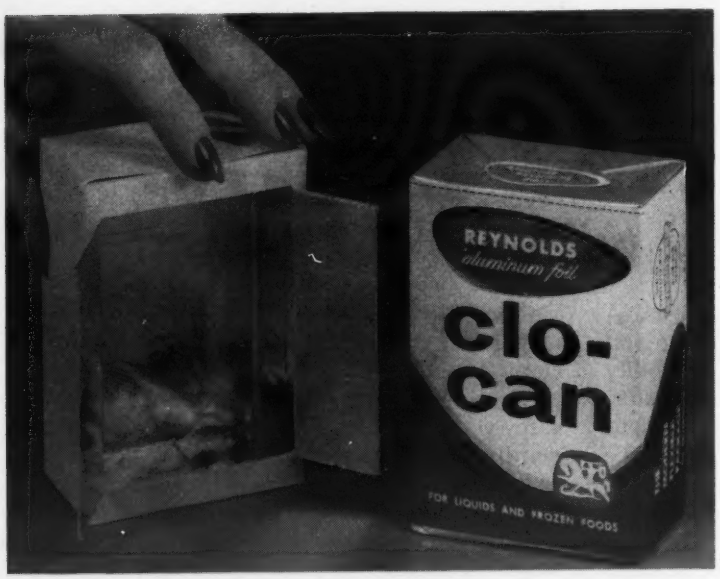
When inquiring check 8296 opposite last page

packaging viewpoint

What's new in products and package design . . . a pictorial presentation . . .

Frozen cream pies . . .

. . . have been introduced in the Southwest by Carnation Co., under their Simple Simon label. Three varieties are in production—chocolate, lemon, and coconut—with a fourth, strawberry, to be added soon. Pies do not require baking; after 45 minutes defrosting they are ready to eat. The one pound pies are manufactured at Carnation's Torrance, California plant.



Foil-fibreboard-foil package . . .

. . . offers many advantages of rigid metal containers though made entirely of flexible materials, according to Reynolds Metal Co., its supplier. Three parts of the package are bonded by microcrystalline wax, and package is easily opened by running knife along dotted lines. Frozen foods, dry soup concentrates, cereals, candies, dried fruits, are said to be especially suitable. Package is supplied by Reynolds Metals Co., Dept. FP, 2500 S. Third St., Louisville, Ky. . . or for more information check 8297 on form opposite last page.

Heat-shrinkable Mylar . . .

. . . is now available for poultry and smoked meats. Pioneer user is Wilson & Co. for their new family-size, cooked, boned, rolled, trimmed, ham. Film has outstanding clarity, retains its high tensile strength from —80 to 300°F. It's available in cut-to-size or continuous tubing form, plain or printed, and closure equipment is now commercially available. Supplier is E. I. duPont deNemours & Co., Inc., Dept. FP, Wilmington 98, Del. . . or for more information check 8298 on form which is located opposite last page.

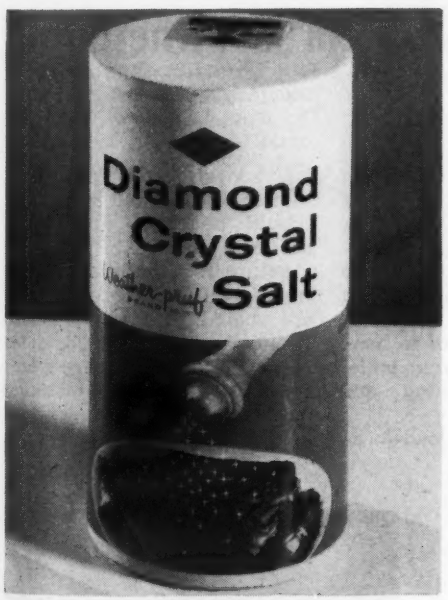
Ready-made meat loaf mix . . .

. . . saves time for housewife—it's simply added to ground meat, together with water, for making meat-loaf, hamburgers, croquettes, etc. Mix contains all the milk, eggs, parsley, tomato, and seasoning that's needed. Product carries Good Housekeeping seal, is put up in 10-oz carton, printed in four colors with illustration of use. Side panels have suggested recipes printed on them.

KRAFT Pure APPLE JELLY
KRAFT Pure GRAPE JELLY
KRAFT Pure BLACK RASPBERRY JELLY
KRAFT Pure ELDERBERRY JELLY
KRAFT Pure GRAPE PRESERVES
KRAFT Pure STRAWBERRY PRESERVES
KRAFT Pure PEACH PRESERVES
KRAFT Pure BLACK RASPBERRY PRESERVES
NEW TWIST OFF CAP

Kraft employs essence addback . . .

. . . for its new line of preserves and jellies. Flavors normally lost in boiling vats are trapped and returned to achieve maximum retention of the natural flavors. New Kraft line is put up in 12-oz jars with twist-off cap and foil label, on which is printed appropriate fruit vignette for each variety. Products are made and packed in plant in Dunkirk, N.Y.



Elegant label for table salt . . .

. . . has been introduced by Diamond Crystal Salt Co., of St. Clair, Mich., on its 26-oz cartons of Weather-pruf brand salt. Background colors are red and white, and feature is four-color illustration of broiled steak with salt "stars" descending from shaker. Package was tested extensively in three cities, met with resounding acceptance. Package designer was Lindstrom & Associates, 70 Park Ave., New York, N.Y.

Plastic squeeze lemon . . .

. . . dispenses single strength lemon juice. Novelty container was recently introduced in Chicago area by ReaLemon-Puritan Co., of Chicago. Acceptance has been outstanding—company reports difficulty in keeping up with demand. Resemblance of 2½-oz container to actual lemon is striking, and it's intended for display in produce sections rather than fruit and juice sections. Label is in form of leaf attached to closure neck.

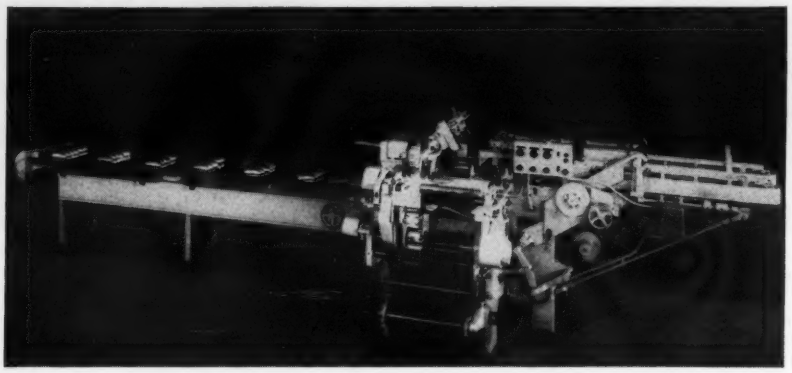
Flip-top box for gelatin . . .

. . . has been introduced by Knox Gelatine Co., of Johnstown, N.Y., for their unflavored gelatine. Well-established label is unchanged, and package is used for both 4-envelope and 32-envelope sizes. Quick fold-back of top makes it easy to remove one or more envelopes, and top is flipped back in place, providing protective closure for remaining envelopes.

LOOK BAKERS!

no bottom cards....
..U boards or trays

NEW 47-H VARIETY PACKAGER



The illustrated Model No. 47-H Variety Wrapping Machine is equipped with extended intake, labeler, reciprocating label imprinter and "one-shot" lubrication to heat seal cellophane overwrapping without trays or cards at speeds up to 65 packages per minute.

you can cut your production costs

on Clustered Hamburger and Hot Dog Buns, Cinnamon Rolls, Cake, Iced Cake, Brown 'n Serve Rolls, Sweet Rolls

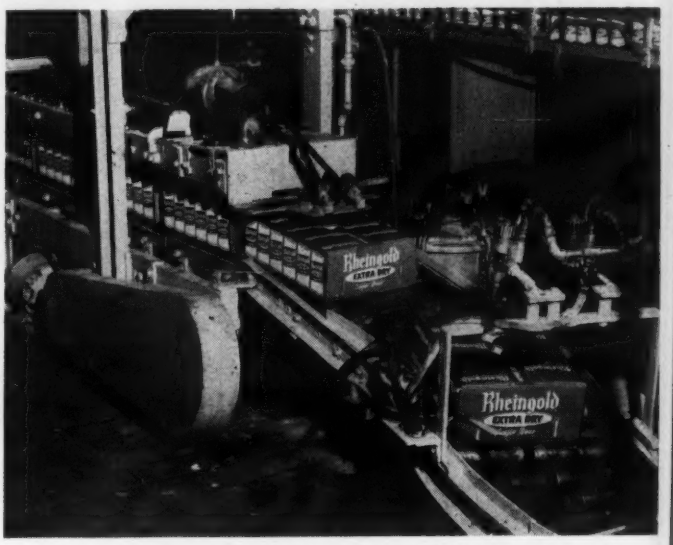
Every *Continuous Flow* machine is created with . . . speed of production, package eye appeal, flavor sealing, versatility of operation and economy . . . as the integral end result of design. On the new 47-H the elimination of bottom cards, U boards or trays gives you a competitive advantage at the retail level and efficient, quick change machine performance provides unusual production versatility. If used for bun wrapping, the machine can be equipped with two speed ranges . . . 30 to 50 per minute for use with 1 bun slicer or 40 to 65 with 2 bun slicers.

let us wrap your product. Send us samples of your products (or if they are perishable, describe the packages and sizes) and tell us the kind of overwrapping you require. We will either wrap and return them promptly with our recommendations, or give you our best suggestions in answer to your inquiry. If you have specific questions. we would welcome a letter from you.

Continuous Flow packaging

BATTLE CREEK
packaging machines, inc.
108 Twelfth Street, Battle Creek, Michigan

When inquiring check 8299 opposite last page



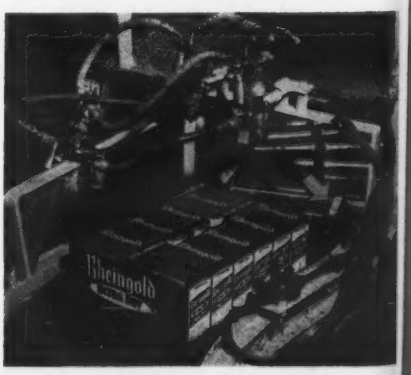
Rheingold beer cases automatically spray themselves with non-skid coating at exit of case sealer

Anti-skid coating solves slipping problem at Rheingold

Problem: Switching to an all-over gloss inked shipping case, meant a more attractive package for Liebmann Breweries in Brooklyn, but it also brought a handling problem along with it. The slick finished cases were hard to handle, kept slipping from pallet loads during stacking and truck shipment.

Liebmann felt a load-locking adhesive was not warranted, but also felt something should be done about this nuisance problem.

Solution: A spraying system was installed, whereby cases are coated with an off-white resin dispersion which dries to a colorless skid-resistant film. Spray gun is mounted on bracket over delivery end of case-sealer compression



Close-up shows switch (arrow) which carton trips to start and stop spray

units. Case itself trips switch to start and stop spray, which is applied to top of case only. Drying is nearly instantaneous and colorless.

Results: Slippage problem has been eliminated entirely. Coating in no way mars or alters appearance of the glossy finish.

(Spray gun was supplied by DeVilbiss Co., Dept. FP, 296 Phillips Ave., Toledo 1, Ohio . . . or for more information check 8300 on form opposite last page.)

(Resyn 32-4150 non-skid coating is made by National Starch Products Inc., Dept. FP, 270 Madison Ave., New York 16, N. Y. . . . or for more information check 8301 on the convenient Reader Service slip opposite last page.)

Prints boxes before packing — cuts inventories

Hopper attachment, metering device end manual operation

Features: Successfully utilizes hopper feed attachment. Previously uneven bulk of corrugated boxes has hampered development of effective hopper feed. Incorporates a metering device originated by Phelps Dodge Copper Products Corp., Yonkers, N. Y. The box printer furnished to this company marks end flaps, ranging in size from 15 x 18" through 20 x 25" flat, with all product identification necessary for warehousing.

Description: Units of this type have a capacity of 3000 per hour, depending on the size of the boxes. Machine can be made to mark one panel, or every panel, flap, and side of a flat box, at the time of packing. Each machine is made to individual printing requirements of customer and range of box sizes.

(Algene flat box printer is a development of Algene Marking Equipment Co., Dept. FP, 232 Palisade Ave., Garfield, N. J. . . . or for more information check 8302 on form opposite last page.)

As many a canner has found from his own experience, Canco's constant effort to produce perfect containers means fewer work stoppages on production lines, lower packing costs and maximum container efficiency throughout the channels of distribution.

Canco's precise specifications for its containers are arrived at only after exhaustive laboratory tests, pilot-line manufacturing trials and experimental packs. This zeal for container perfection also applies to raw materials, packing—even shipping.

That's why containers with the familiar oval can best take your products to market at a profit.

CANCO NBC-TV NEWS

Keep up with container developments! Watch NBC NEWS on TV, presented alternate Mondays by Canco. See your local newspaper for time and channel.

CANCO **AMERICAN CAN COMPANY** New York, Chicago, San Francisco

When inquiring check 8303 opposite last page

Hoerner Boxes, Inc.

has been keeping company with Harding Glass for *20 years . . .*

It's very clear to the Harding Glass Company — Hoerner's ingenious engineering with sturdy corrugated board creates the best and most economical shipping containers for their handle-with-care products.

It's easy to see through the purpose of this ad. We will help solve your shipping problems just as well. One conference with a Hoerner Packaging Engineer will convince you.

Phone or write the office or plant nearest you.

HOERNER BOXES, INC.

GENERAL OFFICES—600 Morgan St., Keokuk, Iowa • PLANTS—Keokuk, Des Moines and Ottumwa, Iowa Sand Springs, Oklahoma • Minneapolis, Minnesota • Fort Worth, Texas • Sioux Falls, South Dakota Fort Smith and Little Rock, Arkansas • Cajas y Empaques Impermeables, S. A., Mexico City D.F., Mexico

When inquiring check 8304 opposite last page

12 bottle items tested sell better with neckbands

In a survey conducted by cellulose neckband supplier on glass-packaged items, use of the neckband increased sales by 17.9% (average). Survey was conducted in New York and Philadelphia areas, covered sales of some 20,600 jars of 12 different items. Sales increases, ranging from 3.4% to 44.1%, were reported for every item tested.

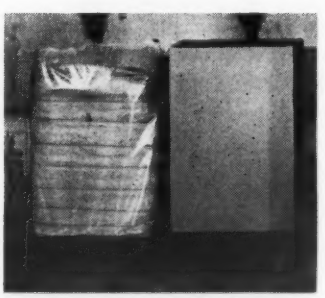
Items tested included table syrup, molasses, condiments, cooking and salad oils, salad dressing, disinfectant, and bleach.

(Cel-O-Seal neckbands are made by E.I. du Pont de Nemours & Co., Inc., Dept. FP, Wilmington 98, Del. . . . or for more information check 8305 on the convenient Reader Service slip which is located opposite last page.)

Cost of hop shipments cut one-half

Compressed bales sealed in film, then cartoned

Packaging and shipping hops for brewer's use in polyethylene film helps to reduce bulk by one-half to ease handling and save space. J. O. Hughes of Tri-State Processing Co., Yakima, Wash., developers of the method, in which bales are compressed to half original size, says that savings run to $1.00 per hundred lb in lower shipping costs.



Compressed bale of hops and shipping carton

GET ACQUAINTED WITH The FOIL-TEX Line Introductory PAK SIZE 250 Per Case

Now you can buy Foil-Tex famous Aluminum foil plates easily without investing too much money—and save space too. Buy them in Paks of 250 introductory size, or 1000 to a case. Below are a few of the standard numbers used throughout the industry . . . if the type you want does not appear ask about it.

GET ACQUAINTED PRICES

Model	Size	Type	Wght. Per Case	Price
1104	4"	Tart	3 lbs.	3.75
1105	5"	Deep Patty	4 lbs.	4.50
306	6"	Pie	5 lbs.	6.00
308	8"	Pie	9 lbs.	8.50
309	9"	Pie	11 lbs.	10.75
310	10"	Pie	13 lbs.	13.50
C18B	8"	Cake	11 lbs.	13.00
P-8	8"	Pizza	8 lbs.	8.75
D-910U	10"	Round Comp Tray	11 lbs.	13.00
D-T100	9x7	Round Comp Tray	9 lbs.	10.00
531	5x3	Rectangular Tray	4 lbs.	5.75
731	7x3	Rectangular Tray	5 lbs.	6.50
751	7x5	Rectangular Tray	7 lbs.	7.50
445	4x4	Disposable Ash Tray	4 lbs.	5.00

Add $1.00 for Parcel Post.

Buy 10 cases of one size or assorted and enjoy a full freight allowance continental U.S.A. plus a 2% cash discount if check accompanies your order. Rated accounts will be sold on open account basis subject to approval of credit department. FOIL-TEX is a trade name of the MALCO Company. (Independent Manufacturer)

Inquiries from Distributors Invited

Foil-Tex

The MALCO Company

Independent Manufacturer

580 S. Alameda St. L.A. 13, Calif.

When inquiring check 8306 opposite last page

Photo shows typical compressed bale and carton in which it is shipped. The double-compression method of packaging, according to Brewer's Hop Research Institute Bulletin No. 3, does not injure the Lypulin glands.

Because the polyethylene barrier is heat sealed, oxidation is minimized and no aroma is permitted to escape.

Tri-State's own experience shows an actual loss of soft resins at no more than 2/10 of 1% to 5/10 of 1%, 1½ years after shipment.

(Visqueen polyethylene film is made by Visking Co., Plastics Division, Dept. FP, Terre Haute, Ind. . . . or check 8307 opposite last page.)

Sealers adapt metal type, apply ink, embossing

Metal type etches ink into film of bags made of polyethylene

Uses: For coding standard range of containers, plus polyethylene bags.

Features: New coding assembly uses metal type for both ink and embossing of codes. One character in code can be changed without altering remaining characters.

Description: New system is now offered in maker's continuous band and rotary sealers. Only a few simple adjustments are reuired, to ready coder assembly for use when an emboss or impression code is required.

(Sealers with ink and embossing coders are available from Doughboy Industries, Inc., New Richmond, Wis. . . . or for more information check 8308 opposite last page.)

Read how dry fluid drive of car puller prevents cars being pulled past beet loading stations at Utah-Idaho Sugar Co. See page 84, 85.

for less than 1/20th of a

SOFT SEAL makes cases easy to open

SOFT SEAL is the simple way to make shipping cases easy-to-open. No gimmicks. No new equipment. No extra labor. Why? Because SOFT SEAL simply replaces adhesives that seal with a hard-to-open tearing bond.

SOFT SEAL allows top-flaps to be lifted without tearing, tugging, straining. Protects goods from damage by eliminating case-slashing in stores and supermarkets. Saves time. Builds goodwill.

. . . all at a cost difference of less than 1/20¢ a case!

SOFT SEAL safely keeps flaps from popping open during shipping and handling. As proved over and over again during ten years of commercial use. We'd like to demonstrate the special adhesive properties of SOFT SEAL in your own plant. Just write or call your nearest National office.

RESYNS® National ADHESIVES

NATIONAL STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

When inquiring check 8309 opposite last page

Shuford's

SHURTAPE®

keeps food packages sealed!

Produce, meats, frozen food packages are sure to stay sealed when you use Shuford's SHURTAPE FP-18. It's quick to stick and stay at sub-zero temperatures on waxed or coated paper, board or plastic bag! Taped packages keep frozen foods airtight indefinitely!

Shuford's SHURTAPE has superior moisture resistance, excellent aging and strength characteristics and retains flexibility regardless of temperature. Easy to unwind from the roll.

Comes in white, red, blue, yellow, orange, green, silver and natural. This rubber-impregnated flat back, pressure-sensitive paper tape can be marked with pencil, pen, crayon or stamped in ink.

Order Shuford's SHURTAPE now and keep your food packages sealed!

Shuford SINCE 1880 Mills, INC HICKORY, N. C.

CLOTHES LINES • TWINES
PRESSURE-SENSITIVE PAPER TAPES
SASH CORDS • WEATHER STRIPPING
COTTON & RAYON YARNS • EXTRUDED PLASTICS

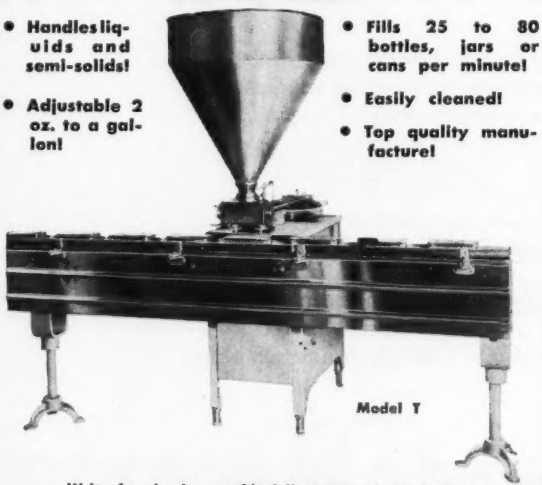
World's Largest Manufacturer of Cotton Cordage

When inquiring check 8310 opposite last page

THIS INEXPENSIVE FILLER DOES YOUR FILLING JOB!

SIMPLEX FILLER

- Handles liquids and semi-solids!
- Adjustable 2 oz. to a gallon!
- Fills 25 to 80 bottles, jars or cans per minute!
- Easily cleaned!
- Top quality manufacture!



Model T

Write for circular on this fully automatic Model T (2 pistons) and other Simplex fillers.

F. L. BURT COMPANY

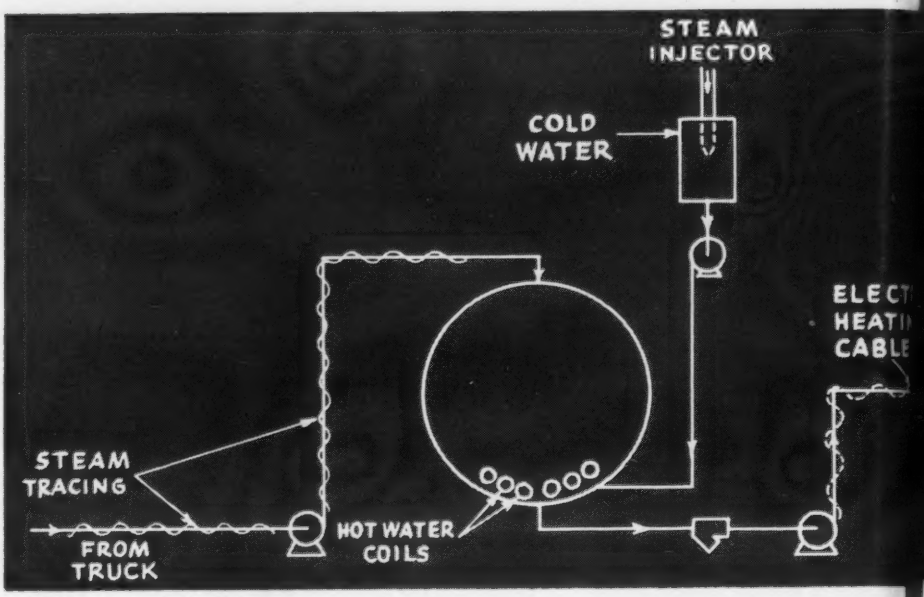
571-7th Street • San Francisco 3, Calif. • Phone KLondike 2-2020

Name .....

Address .....

City ..... **State** .....

When inquiring check 8311 opposite last page



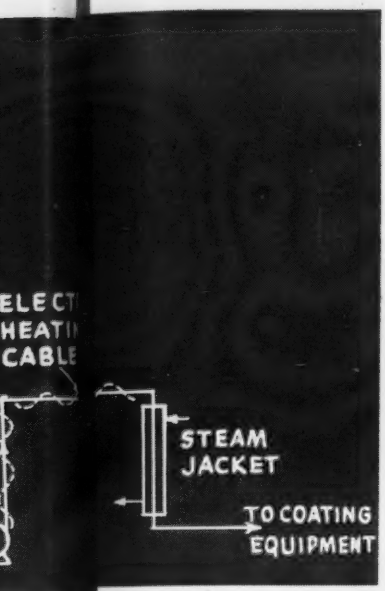
Page Dairy uses liquid wax system for milk cartons, now enjoys . . .

- **more uniform coating**
- **less flaking**
- **less leakers**

ARNOLD PAGE, Vice Pres. and Prod. Mgr. and **BERNARD VOZOBULE,** Milk Dept. Supt.
Page Dairy Co., Toledo, Ohio
as reported by **FP staff**

Page Dairy's recent switch from conventional slab wax to a liquid wax system has resulted in much more efficient handling, lower wax costs, increased sanitation, and considerably less customer complaints of flaking and occasional leakers ("loudest" complaints were from babies whose bottle nipples were clogged by wax flakes). The liquid wax system has proved to materially cut coating costs. The Toledo dairy using cartons exclusively, installed the new waxing sys-

Wax storage tank was first installed outdoors, then small "wing" was built around it



Schematic diagram illustrates wax handling system at Page Dairy. Now in planning stage, is return line from coating equipment to storage tank

tem a year ago.

Under Page's old system, slab wax was delivered by trailer truck in 40,000 lb lots. Four men were used to unload trailer and stack the 30-lb boxes of slabs in warehouse. About 2000 lb had to be moved manually each day out of storage, and melted in chamber of coating machines, an operation requiring over an hour daily. Disposal of the slab cartons was also a nuisance.

With the new system, liquid wax (a special blend of microcrystalline and regular

(*Turn to page* 98)

Plant superintendent Vozobule inspects level of wax in sight glass

Pay-off packaging . . . *with plastic containers made of Styron*

That "fresh daily" look sells! Delicatessen foods need the protection and extra visual appeal of plastic containers made of Styron®. Old-fashioned containers just won't supply the showmanship that moves these foods off your counters.

Perishable foods like this demand special protection . . . special eye appeal. And you get them both in Styron plastic containers! Opaque, crystal clear or in kitchen-fresh colors, they give foods the "made-at-home" appeal that sells. They come imprinted or labeled and all have tight-fitting lids.

Preparing and packaging delicatessen foods? Then let Dow suggest a manufacturer who can supply these containers promptly. If you buy these foods, insist that they be supplied in Styron plastic containers. Either way, you'll find this protective, visual packaging pays off for you in sales and repeat sales. THE DOW CHEMICAL COMPANY, Midland, Michigan. Packaging Service Dept. PS1518N.

Packaging Service PS1518N
THE DOW CHEMICAL COMPANY
Midland, Michigan

Please send me the Catalog of Packages.
Item to be packaged_____

NAME_____ TITLE_____
FIRM NAME_____ ADDRESS_____
CITY_____ ZONE_____ STATE_____

YOU CAN DEPEND ON DOW

When inquiring check 8312 opposite last page

Oranges
Strawberries
Cherries

Whether your fruit product is large as a grapefruit or small as a currant . . . is grown locally or in the tropics . . . is frozen, fresh or dried . . . sliced, crushed or diced . . . squeezed into a juice or mashed into a sauce . . . processed into a concentrate, syrup or extract . . . or is still in its original whole . . .

Continental has the right package for you!

Each Continental division is a leader in its field. Each has its own unexcelled facilities for manufacturing, research, development and sales. Now, each is backed up by a breadth of experience unmatched in the packaging industry.

CONTINENTAL CAN COMPANY

SERVING INDUSTRY...SERVING AMERICA

TAILOR-MADE PACKAGE SERVICE

CANS • VAPOR-VACUUM® CLOSURES • FLEXIBLE PACKAGING • FIBRE DRUMS • SHIPPING CONTAINERS • STEEL CONTAINERS • PAPER CONTAINERS • PLASTIC CONTAINERS • FOLDING CARTONS • DECOWARE® • CROWNS AND CORK • BONDWARE® • GLASSWARE • BAGS • CONOLITE® • GLASS CONTAINERS • PAPERBOARD

(This advertisement originally appeared in full-color in TIME, BUSINESS WEEK and FORTUNE.)

For more information on product at left, specify 8313 see information request blank opposite last page.

Liquid Wax

(*Continued from page 95*)

dairy waxes) is shipped at 185-190°F by tank truck to the dairy, then piped to Page's heated storage tank. Capacity of tank is 9000 gal, about 15 days supply. Tank is heated by hot water coils at bottom (steam is not used because it would burn wax). Tank contents are thermostatically controlled at 165°F. Close control is essential because high temperatures affect quality of wax. Wax is heated to about 175°F just before using. All piping is heated either by steam tracing or electric cable.

(Liquid wax handling system was supplied by Stainless Products Corp., Dept. FP, Belding, Mich. . . . or for more information check 8315 on convenient Reader Service slip opposite last page.)

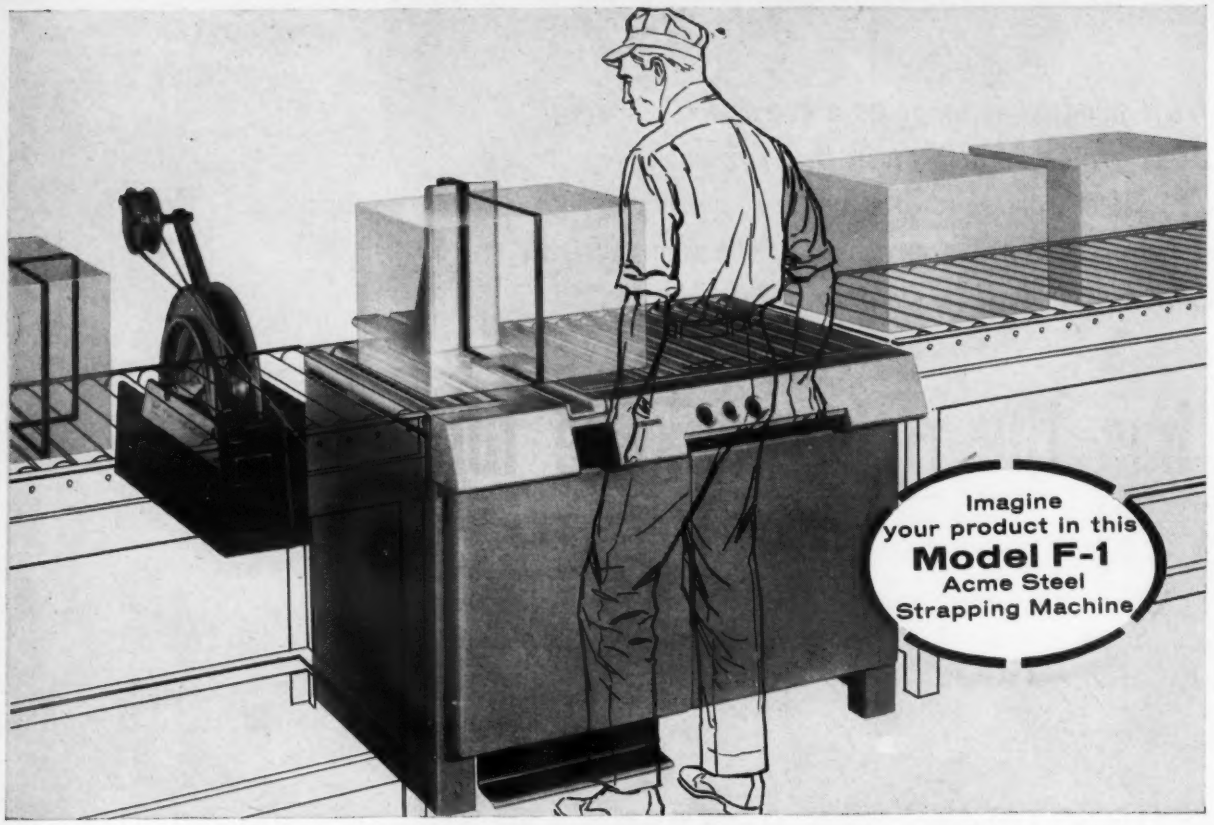
Vibratory feeder has deviation of less than 1%

Units combine vibratory and screw principles

Features: Vibration serves to fluidize dry material, as it is metered with an accuracy of plus or minus 1%. Feed rate can be varied approximately 100 to 1 through infinitely variable transmission. Density of material is controlled before metering, eliminating variations due to aeration.

Description: Unit consists of an arrangement of a screw mounted on a vibrator in such a way that screw, screw tube, screw trough and screw bearing vibrate as one assembly, while the screw rotates. Discharge is in proportion to screw rotation speed. Pilot plant model is built in screw sizes up to 1½". Results with this unit are reproducible on industrial sizes from ¼ to 10".

(Pilot and industrial Vibra Screws are built by Vibra Screw, Dept. FP, P. O. Box 62, Williston Park, N. Y. . . . or check 8316 on convenient Reader Service slip opposite last page.)



Line up your AIM*. . . others find it pays . . .

Let this idea machine break packaging bottlenecks

YOUR ACME IDEA MAN can prove to you, as he has to others, how the Acme Steel F-1 Strapping Machine breaks high volume packaging bottlenecks. This Idea machine, designed for straight line packaging procedures, speed-applies steel strapping to help you ship your products in safe, secure, tamperproof, economical packages. And its fast, push-button operation lets even intermixed package size variations flow from production line to transportation with no delays for machine adjustments.

Your local Acme Idea Man is a trained source of packaging ideas that can benefit you.

It's easy to operate the F-1 machine . . . operators require only nominal instruction and maintain high output levels because of less fatigue. The F-1 is electrically powered and can be made fully automatic. It is controlled with fingertip ease to automatically tension and cut steel strapping with no waste. Ends are permanently joined by two instantly applied spot welds . . . and the package is ready for shipping.

***Line Up Your Acme Idea Man Today.** Whoever he may be, your Acme Idea Man is ready to prove how the F-1 Machine or any of the Acme Steel Idea products can bring you new high standards of packaging speed, efficiency and economy. For his name, write to Dept. FGS-67, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Avenue, Toronto 13, Ontario.

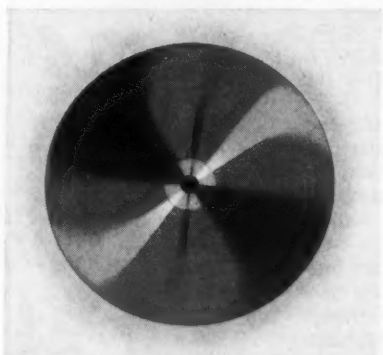
ACME STEEL **STEEL STRAPPING**

When inquiring check 8314 opposite last page

Centrifugal Spray process — first of its kind! — employs a dynamically balanced wheel which spins at more than 3,600 r.p.m. As the wheel travels back and forth through each drum shell, the lining material is "spun out" through tiny holes in the wheel's edge.

New Rheem process gives you a completely uniform lining

...drum after drum after drum



New Centrifugal Sprayer spins off a continuous curtain of atomized lining material at a uniform rate.

Uniform lining thickness—controlled to within .1 of a mil
Uniform viscosity of lining materials with lower solvent content
Uniform application:

- Completely automatic · No air used in spray
- Spray travels same distance to coat all surfaces
- No air turbulence, primary air or drum rotation

Uniform curing:

- 3-stage ovens with controlled temperatures
- Controlled air flow by placing drums upright in oven

This new Rheem Centrifugal Spray process is so fully automatic, drum linings can't vary from one drum to the next, one day to the next.

It's a vast improvement over all other lining methods. For it does away with troublesome air turbulence that causes oil, dust and dirt to gum up linings applied by conventional methods.

It minimizes pinholing and blisters. It eliminates chance for human errors. It even helps the new Rheem high-temperature, vertical ovens do a still better curing job!

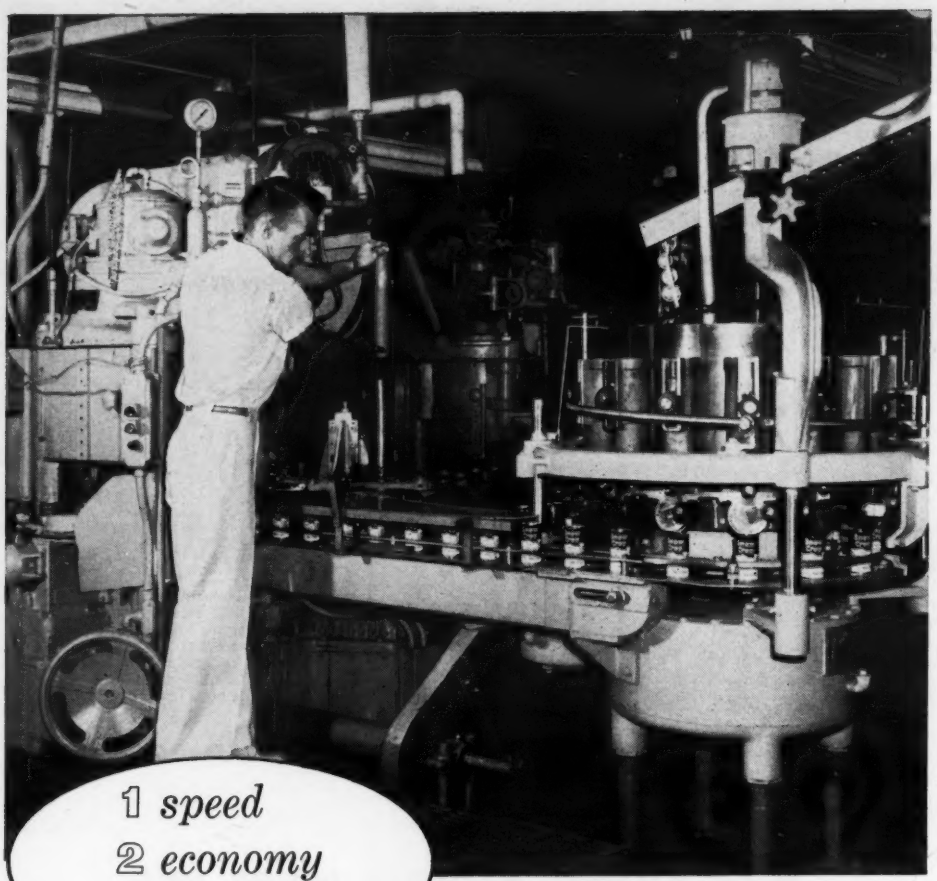
Why not contact our nearest office for full details.

YOU CAN RELY ON Rheem WORLD'S LARGEST MAKER OF STEEL SHIPPING CONTAINERS

Rheem Manufacturing Company

Richmond and South Gate, Calif. • Chicago • Linden, N. J. • New York • Houston • New Orleans • Sparrows Pt., Md.

When inquiring check 8317 opposite last page



1 *speed*
2 *economy*
3 *accuracy*

How to put ALL 3 into your food packaging

If you're packaging a *viscous* or *semi-solid* product, Pfaudler piston fillers can help you do it more quickly, more economically, and with greater accuracy. Here's why!

Speed. You just can't get the same filling action from any other piston filler. Pfaudler's *patented* two-port rotable valve, automatic take-up, and cam control give you filling speeds up to 1000 containers per minute! Speed depends, of course, on filler model, container size, and the fluidity of product.

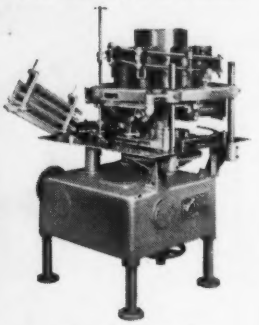
Economy. Savings come to you in many ways. Take cleaning, for example—the exclusive one-piece valves slide right out and the simple *ring-free* pistons lift out. One man can perform the entire cleaning operation in less than a half hour. So, your operating expenses go down. And maintenance costs go down, too. Pfaudler fillers have but four primary wearing parts—each one durable, easy to install, and *low in cost.*

Accuracy. The closer you control fill, the easier it is to keep costs in line. Pfaudler piston fillers assure accurate filling. In fact, for stated applications, they're guaranteed to fill within specified tolerances — *usually* within ± 1/10 ounce.

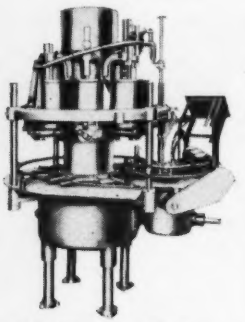
You can put all three of these benefits into *your* food packaging with one of the five available models. To find out which model best suits your product, contact your Pfaudler representative.

Or drop us a line. Just ask for Bulletins 911 and 911-S.

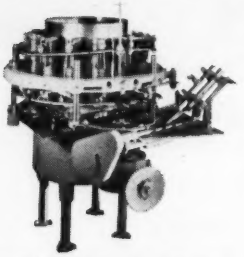
Five standard models of Pfaudler rotary piston fillers



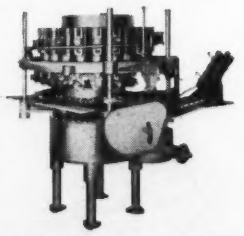
Model RP-6 Six Stations



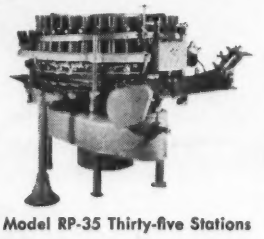
Model RP-7 Seven Stations



Model RP-14 Fourteen Stations



Model RP-21 Twenty-one Stations



Model RP-35 Thirty-five Stations

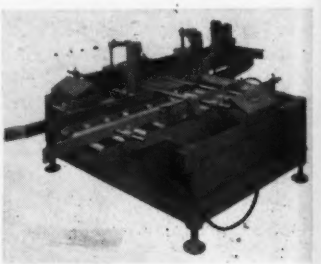
THE PFAUDLER CO. Pfaudler **ROCHESTER 3, N. Y.**

When inquiring check 8318 opposite last page

packaging

Automatically imprints cases on four sides

Firm name and contents are automatically imprinted on two panels and two ends of case, by a new imprinter. No manual positioning is necessary. Machine also imprints serial number.



Prints firm name, contents, etc. without manual positioning

Need for four-side imprinting has been created by growing use of automatic palletizing. Machine imprints from one to eight lines within a printing range 11" high. Type may be graduated from ¼" to 1½" high. Serial number device prints 6 digits in figures up to 1½" high.

(Case imprinter is available from J. L. Ferguson Co., Dept. FP, Joliet 5, Ill. . . . or check 8319 on form opp. last page.)

". . . and vitamins A, A-1, A-2, B-2, Niacin, Riboflavin, LX-234, and Super "C" Compound . . . if pains persist, see a doctor . . ."

briefs from contemporary publications

Here's a quick look at articles appearing in other technical and business magazines

Permeability of packaging films to gas mixtures

Studies on Pliofilm, mylar, nylon, and polyethylene showed that mixtures of carbon dioxide with nitrogen, oxygen, or helium passed through as if the gases were pure instead of mixed. When water vapor was added, hydrophobic films (polyethylene and mylar) behaved as before; hydrophilic film (nylon) greatly increased in permeability in proportion to relative humidity. 5 pages, 9 tables, 3 graphs, 1 diagram. (*"Tappi", March* 1957, *page* 142)

Vacuum belt drier for fluid foods

Soluble coffee, fruit juices, and milk can be dried in a continuous vacuum dehydrator in only a few minutes. Product is cooled before discharge and the vacuum broken with inert gas. Details of design and operation are given. 3 pages, 4 photos, 1 drawing. (*"Chemical Engineering Progress," March* 1957, *page* 110)

Carotene is stable butter color

Neither chemical analyses for quality nor taste tests could distinguish butter colored with carotene from that colored with coal tar colors. Both the color and the vitamin A value of the carotene were stable in normal storage. 8 pages, 8 tables. (*"Journal of Dairy Science," February* 1957, *page* 192)

Checking labor costs by sampling methods

Detailed instructions tell how to analyze production costs, especially labor costs by the "ratio-delay" method. It involves the tallying of repeated samplings rather than stopwatch studies. 4 pages, 1 layout, 2 charts. (*"Food Engineering," April* 1957, *page* 63)

Flame as detector for gas chromatograph

A flame and thermocouple function well to detect passage of components of a mixture in gas chromatography if hydrogen is used as sweep gas. Results on essential oils are shown. 2 pages, 1 photo 4 chromatograms. (*"Analytical Chemistry," March* 1957, *page* 55A)

Insect control on vegetables

Latest studies on how to treat and how not to treat vegetables for control of cabbage maggots, cabbage aphids, and asparagus beetles. 1 page. (*"Canning Trade," April* 15, 1957, *page* 6)

Chlorine Dioxide destroys tocopherols

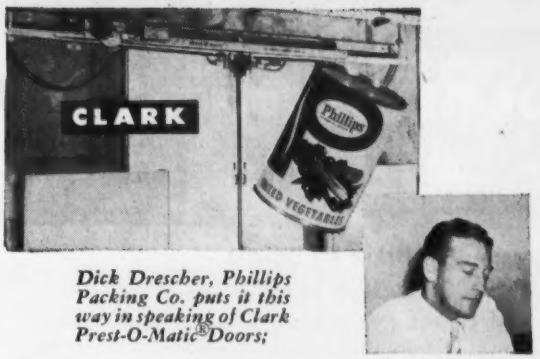
Chemical tests for tocopherols confirmed by animal tests for vitamin E show that chlorine dioxide destroys most of the tocopherols in flour when used at normal bleaching levels. 8 pages, 6 tables, 4 tissue section photos, 1 graph. (*"Journal of the Science of Food & Agriculture," February* 1957, *page* 97)

Standard pallets proposed

A list of 10 pallet sizes have been prepared for establishment as an American Standard for maximum efficiency. A chart shows space utilization of each in boxcars and trailers. 2 pages, 1 table, 5 graphs. (*"Good Packaging," March* 1957, *page* 42)

Off-flavors in milk

Eight types of off-flavor occur in milk. Causes and methods of control are given. 3 pages. (*"Milk Plant Monthly, March* 1957, *page* 33)



Dick Drescher, Phillips Packing Co. puts it this way in speaking of Clark Prest-O-Matic® Doors;

"Saved many man hours"

At Phillips Packing Company perfection comes naturally. One important factor is the Clark Prest-O-Matic® Door installation. Open door time is reduced up to 75%, resulting in larger refrigeration savings and maintenance of correct temperatures.

Dick Drescher further noted the full utilization of man truck hours with more goods handled in less time.

The Clark idea of furnishing a *completely packaged* assembly guarantees a correctly engineered and integrated product.

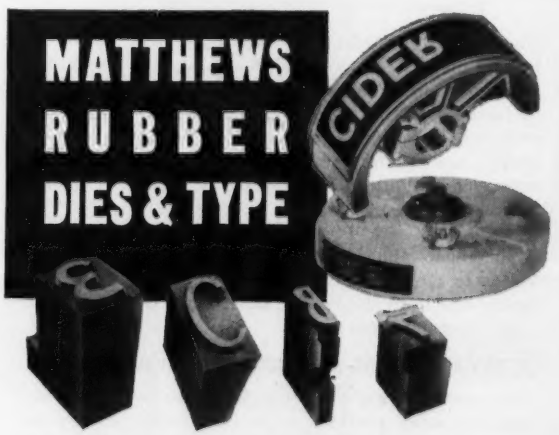
WRITE for detailed information and free brochure.

CLARK DOOR COMPANY

504 Hunterdon Street, Newark 8, N. J.

When inquiring check 8320 opposite last page

MATTHEWS RUBBER DIES & TYPE



For any application

Coding right on your moving lines with Matthews' Rubber Roller Dies and Interchangeable Type is the fastest, surest, most efficient and economical method you can use. Type shapes and sizes for any existing application, or methods can quickly be developed for your requirements. Inks available for every need.

Write for samples, stating on what type of equipment coding is to be done and your particular marking problem.

JAS. H. MATTHEWS & CO.

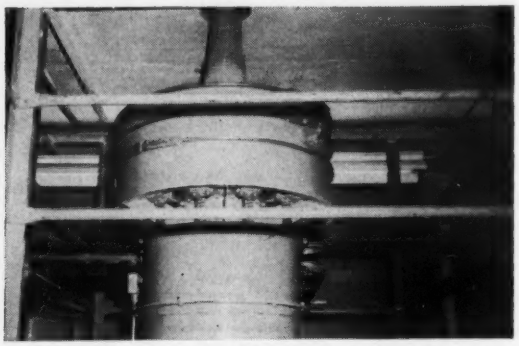
3950 Forbes St. Pittsburgh 13, Pa.

PHILADELPHIA · CHICAGO · CLIFTON, N. J. · BOSTON · JACKSONVILLE

When inquiring check 8321 opposite last page

General Mills Makes Kix Uniform with SWECO Vibrating Screen Separator

Grading problems with Kix cereal at the General Mills plant at Toledo, Ohio have been solved by the installation of a 48" diameter SWECO Vibrating Screen Separator. To obtain a more uniform finished product, General Mills uses the SWECO unit to remove over or undersize Kix pellets.



Continuous operation of this SWECO *Separator at General Mills plant assures uniform finished cereal product. Spring-mounted screening unit transmits no vibration to the base.*

The Separator is equipped with 5/16" and 1/8" opening stainless steel screen cloths. The 5/16" openings of the top screen cloth remove all the large pellets and discard pellets that are stuck together. The 1/8" screen cloth on the bottom removes all the fine particles that could cause equipment problems in subsequent processing operations. The Separator is equipped with a dust cover and tight flexible connections to eliminate dusting while the unit is in use.

The Toledo plant has four additional SWECO Separators to handle other grading problems. The installation has been duplicated in another General Mills plant that produces cereal.

Screening Analysis and Recommendations Available

Your nearby SWECO District Engineer is available to help you with special screening problems. His "know-how" covers 200 different materials . . . wet and dry, coarse and fine, heavy and light. He will demonstrate, in your plant, how a SWECO Separator can screen your material economically and efficiently. No obligation, of course.

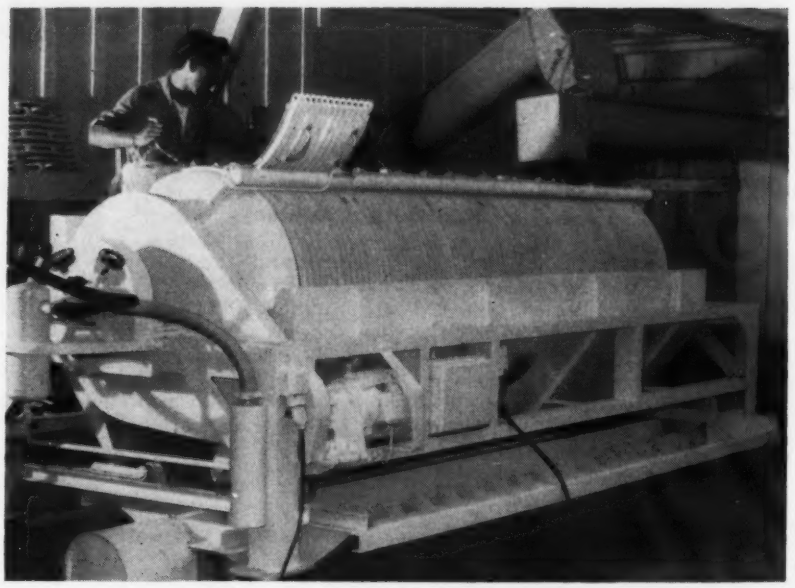
A complete data file on screening food products plus a 22-page catalog are yours for the asking. Write for Bulletin S-115-4.

SWECO SEPARATORS

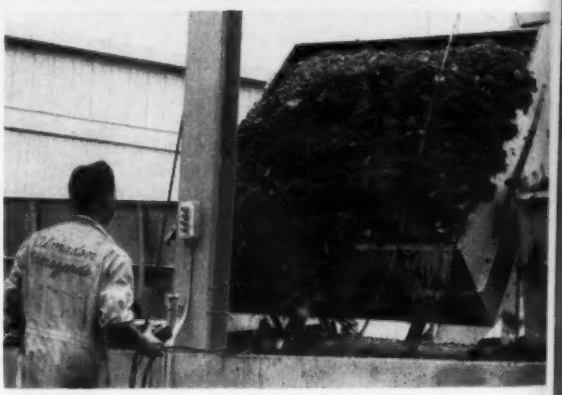
SOUTHWESTERN ENGINEERING COMPANY
4300 Santa Fe Ave., Los Angeles 58
LUdlow 3-6262—Cable: SWECOLA

Engineers and Constructors . . . Manufacturers

When inquiring check 8322 opposite last page



Press consists of the central cylinder shown here. Rubber bag inside is inflated; juice is pressed through slots in periphery of cylinder. Cylinder is revolved by the drive shown at near end. Compressed air lines to inflate rubber bag are also shown.



At Almaden Vineyards, grapes are received in bulk hopper trucks, unloaded by push-button winches

inflatable rubber bag squeezes fruit juices

One man operates new German press at Almaden Vineyards, vs. three for basket press

Shorter juice-pomace path, larger pressing area produce high juice yield, better flavor

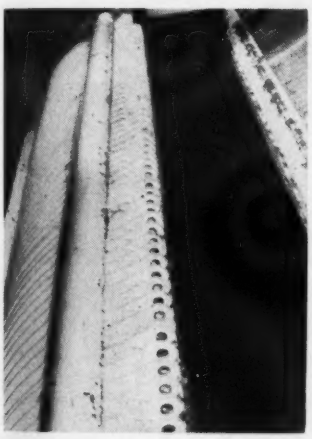
AL HUNTSINGER,
Wine Production Mgr. Almaden Vineyards
As reported by **KARL ROBE** Associate Editor

Problem: Almaden Vineyards, a relatively small winery in Los Gatos, Calif., which produces fine table wines, increased the capacity of their wine making facilities, and thus created need for more pomace-pressing capacity. Standard method for pomace was to use a basket press. Such a method requires three men to operate: One to shovel pomace at the press; a second to observe and control the press cycle; and a third to clean up the basket after each run.

This latter job is important, since the

basket-staves form crevices in which pomace can cling and finally clog the juice openings. Burlap lining is sometimes used to forestall this plugging, but this also has a high manual labor requirement.

Solution: Almaden was one of the first two companies in the US to use a German-design press which uses an inflatable rubber bag to furnish the pressing action. This vulcanized bag, about 16″ in diameter, before inflation, extends horizontally down the center of the pressing cylinder (which is 28″ inside diameter). Rubber bag is made of 1″ thick natural rubber.



Looking into press shows rubber bag, bottom right. Pomace is entering at top right

Pomace is filled into the horizontal cylinder of the press, which consists of a slotted screen periphery enclosed in an open housing of circular ribs (some construction details are visible in the accompanying illustrations). When filled, the press is closed, the bag inflated, and the pomace is squeezed outward against the slotted screen.

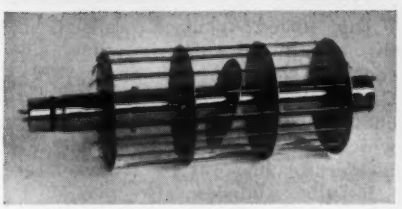
Sequence of Operations

In practical operation at Almaden, here is the specific sequence: Pomace is filled from an overhead conveyor (top right of photo above), and the press is closed. Operator then pushes a button which revolves the entire cyl-

(Turn to next page)

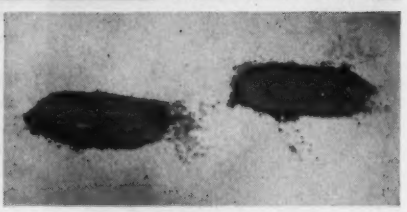
Now! For the first time

intimately blend any liquid, regardless of viscosity, into dry solids–in one fast step–even up to 40% liquid volume by weight



VERSATILE. This wire cage assembly gives you three blenders in one. With it you can blend liquids into solids, or obtain dry intensive mixing action. Remove it and get gentle blending.

TYPICAL EXAMPLE. Bar breaks down agglomerates in material at left and prevents new agglomeration as liquid is added. Note uniform consistency in finished blend at right.



ABSOLUTE UNIFORMITY. Laboratory smear test reveals streaks where standard blending methods are used (left). With P-K's exclusive design, complete blending is assured (right).

These results can be proved in your own lab with a P-K Laboratory Model Liquid-Solids* Blender. 8 or 16 qt. capacity available from stock for instant delivery.

Scale-ups from lab tests are equalled or bettered in P-K production models with capacities from 1 to 50 cubic feet. This is a completely new concept in liquid-solids blending—exclusive with P-K.

Write now for Bulletins 15A on lab units, 7-15-A on production units of P-K liquid-solids blenders. The Patterson-Kelley Co., Inc., 156 Hanson Street, East Stroudsburg, Pa.

Patterson Kelley

Chemical and Process Division

P-K Twin Shell Blenders* • Heat Exchangers

Packaged Pilot Plants • P-K Lever-Lock Doors*

*Patents pending

When inquiring check 8323 opposite last page

Cambridge

Wire Mesh Belts give you continuous, low-cost processing, greater uniformity

Whatever the type of product you are processing, moving it on continuous, wire mesh belting through each operation will help increase product uniformity, cut operating costs, reduce manual handling and maintain sanitary requirements. Baked goods, meats, vegetables, fruits or candy are baked, cooked, cooled, washed, blanched or frozen faster and with a minimum of waste or damage. EXAMPLE:

Continuous Baking

WIRE MESH BELT carries thousands of crackers through oven in a continuous stream. Open mesh permits heat to circulate freely around product, giving greater uniformity. Crumbs or waste particles fall through, keeping belt and foods contamination-free.

ALL METAL BELT remains impervious to high or sub-zero temperatures, cannot absorb odors . . . is unaffected by washing or blanching solutions. Rust-proof stainless steel alloys maintain sanitary requirements.

WOVEN WIRE CONSTRUCTION gives longer wear because there are no seams, lacers or fasteners to weaken or break.

SPECIAL CROSS FLIGHTS or raised edges are available to hold product on belt during flat or inclined travel.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can get continuous, low-cost processing and greater product uniformity on woven wire conveyor belts. Look for his telephone number under "Belting, Mechanical" in the *Yellow Pages*. Or, write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

WIRE CLOTH | WOVEN WIRE CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Department H, Cambridge 6, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check 8324 opposite last page

Grape Press

(*Continued from page* 103)

inder. This distributes the pomace evenly around the periphery of the screen.

Compressed air then inflates the rubber bag, which extends the full length of the cylinder. One-half atmosphere (around 7 psig) is applied for one minute for an initial pressing. The pressure is increased to 1 atm, held for one minute, then increased to 1½ atm, held for one minute. Pressure is then released and cylinder is revolved to tumble pomace and break up any tendency for it to plug up the passage of juice through the mass.

Air pressure is then increased to the final 5 atm. Here it is held for about five minutes. If desired, the press can be kept spinning throughout the entire cycle, although there is no advantage to this procedure at Almaden.

While pressing, the juice drains into a trough beneath the slotted cylinder and is pumped into vats. A screw conveyor is moved into place beneath the cylinder when it is time to discharge the pomace. This discharge conveyor and the juice trough are made as a single unit, and ride side-by-side on rails beneath the press (see photo page 102). It takes only a turn of the handle to change over from juice-discharge to pomace-discharge.

The dried pomace falls through the opening in the concrete shown in the photo. Under this opening runs an endless rubber-fabric belt which takes the pomace to a hopper for disposal by truck.

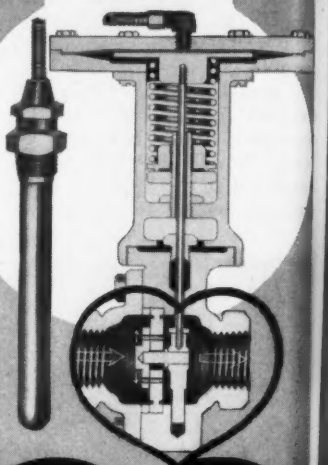
Results: Almaden, after two full seasons of operation, reports multiple advantages as compared with use of a basket press:

One man operates it, vs. three for a basket press; entire pressing cycle is 45 minutes, compared to an hour for a basket-press crew; the faster pressing cycle, plus a capacity double that of a large basket press, allows Almaden to complete all necessary pressing in an eight-hour day, without going into extra shifts.

(*Turn to next page*)

OPW-JORDAN

No. 180 **self-operating temperature control valve**



with the sliding gate and plate

the heart of the OPW-JORDAN Regulator

the different and improved way to control temperature

- GUARANTEED DEAD END SHUT-OFF
- MORE ACCURATE REGULATION
- ELIMINATES NEED FOR PRESSURE REDUCING VALVE ON HIGH INLET PRESSURES

The unique basic design and exclusive features of this valve are responsible for its outstanding performance and long dependable service life. Durably constructed for hard, constant use, the compact, space saving, No. 180 offers the full advantage of accurate control with desired sensitivity of response.

For more facts, write for Bulletin J-180

JORDAN CORPORATION
INDUSTRIAL SALES DIVISION OF OPW CORPORATION
6013 Wiehe Road
Cincinnati 13, Ohio
ELmhurst 1-1352

When inquiring check 8325 opposite last page

A Contamination-Free Product

Protect pumps, meter, product

No. 187
Bottom Outlet
Type

WITH OPW

line strainers

No. 187-F
Bottom opening
type. 125 pound

No. 387
Top outlet type.
125 pound.

No. 387-F
Top outlet type
flanged. 125 pound.

No. 487-F
Top outlet type
flanged. 200 pound.

OPW Line Strainers remove dirt, scale, rust and other solids from liquids flowing in any pipe line system. This positive screening-out process protects and prolongs life of pumps, meters, loading valves, and mechanical equipment. Pipe-snug fit of cage and screen, plus larger than pipe size screen area, assures *free* and *complete* flow of product through strainer. Screens can be quickly and easily removed for periodic check-ups, cleaning and replacement.

Bulletin F-36 gives full details on sizes, styles, screen mesh, etc. Write today.

JORDAN CORPORATION
Division of OPW Corporation
6013 Wiehe Road Cincinnati 13, Ohio
ELmhurst 1-1352

When inquiring check 8326 opposite last page

Grape Press

(*Continued from page* 104)

Juice yield is high, and quality of juice is considered better. The final press cake is only 1⅜" thick, so that the pomace offers little impedance to the flow of juice. Force is exerted over a wider area by the internal bag, so that pressure on any given area is lower, thus giving a lower extraction of skin and stem materials.

(Willmes Press is distributed in eastern US by Hubert C. Stollenwerk, Dept. FP, Hamburg Ave., Egg Harbor City, N.J. and in 11 western states and Hawaii by King Sales & Engineering Company, Dept. FP, 441 Folsom St., San Francisco 5, Calif. . . . or for more information check 8327 on form opposite last page.)

Snap-apart design speeds cleaning of comminutor

Suitable for wet as well as dry products

Uses: Smoothing baby foods, grinding cracker meals, breading compounds, continuous spice grinding, sugar and gelatin. Peanut butter, chocolate liquor, emulsions and colloidal suspensions obtained under liquid tight conditions.

Features: Snap-apart construction of all functional parts permits easy, thorough cleaning. Many rotor applications extend applications of single basic unit.

Description: Designed for continuous processes where needed, the equipment includes units for size reduction of wet as well as dry products, spray blending of dry and wet ingredients. Rotor is reversible on splined shaft for dual purpose blades. Spindle is supported in an integral line-bored housing for long alignment of bearings.

(Impact-in-air comminutor is built by Cog Corp., Dept. FP, 4441 W. Lake St., Chicago 24, Ill. . . . or check 8328 on form opposite last page.)

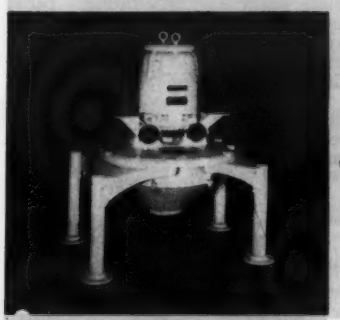
LET'S FACE IT!!

INFESTATION
IN A BULK SHIPMENT = $45,000 LOST

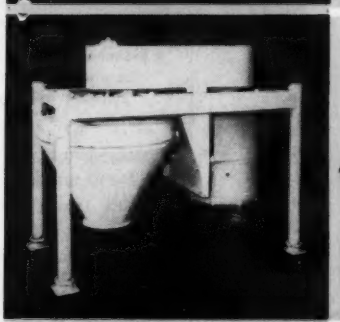
The shipment of finished mill products by bulk is an accomplished fact . . . in most instances this means high flow rates for loading.

Infestation such as a single living egg, bug larvae, flour beetle, or grain moth, etc., in a bulk shipment can multiply in transit so that the entire shipment would be a total loss . . . and this loss can be staggering . . .

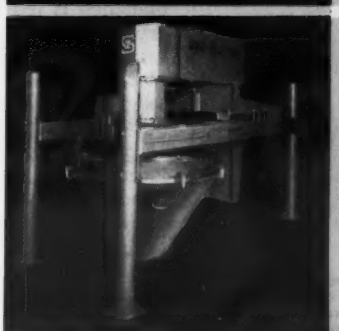
A SINGLE "ENTOLETER" INFESTATION DESTROYER will provide continuous infestation protection and will handle your capacity REGARDLESS of the rate of feed to your bulk shipment container . . .



"ENTOLETER"
INFESTATION DESTROYER . . . series 14
- available with 2 to 10 hp motors
- capacities up to 16,000 lbs. per hour



"ENTOLETER"
INFESTATION DESTROYER . . . series 27
- available with 10 to 40 hp motors
- capacities up to 40,000 lbs.



"ENTOLETER"
INFESTATION DESTROYER . . . series 40
- available with 50 to 100 hp motors
- capacities up to 100,000 lbs. per hour

The "Entoleter" product line also includes . . . the "ENTOLETER" SCOURER-ASPIRATOR for grain cleaning and fragment control . . . the "ENTOLETER"-SIMON SUCTION FILTER DUST COLLECTOR for product recovery . . . "ENTOLETER" CENTRIFUGAL MIXERS AND IMPACT MILLS . . . and PNEUMATIC CONVEYING.

ENTOLETER DIVISION
SAFETY INDUSTRIES, INC.
P.O. Box 904 New Haven 4, Conn.
Write for additional information

When inquiring check 8329 opposite last page

The moment of decision
LET ADVANCE DESIGN
SPRAY NOZZLES
HELP YOU HOLD HER by improving product quality in WASHING, MIXING, SPRAY DRYING AND COOLING
Once you know the ideal values for such variables as particle size or impact . . . you will find Spraying Systems spray nozzles the "precision" instruments to meet your performance specifications. When product quality depends upon spray nozzles, you can depend upon Spraying Systems. Your inquiry is invited...ask for Catalog 24.
WRITE FOR CATALOG 24
SPRAYING SYSTEMS CO.
3213 Randolph St. • BELLWOOD, ILLINOIS
SPRAY NOZZLE DESIGN FOR NEW DIMENSIONS IN CONTROL AND PERFORMANCE

When inquiring check 8330 opposite last page

new!
"LARGE SIZE WIRE"
Kleenslot
PREPARATION SCREEN
Wedge-Wire profile F217 - .312x.187
F250 - .375x.191
. . . for dewatering, screening, washing, extracting, filtering or sizing. Designed for extended life in abrasive applications. Easily maintains openings from ½ inch to as close as 1 m.m. Exclusive Independent Flexing Action provides greater screening capacities. Adaptable to vibrator applications. Available in many metals. Furnished in guard bars and special shapes or designs. Write for prices and details—send your specifications.
WEDGE-WIRE CORPORATION
Wellington, Ohio

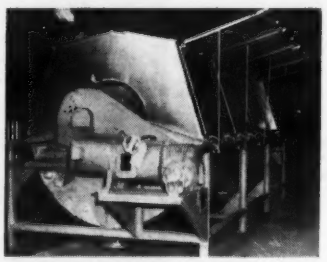
When inquiring check 8331 opposite last page

Blancher's construction follows NCA ideas

Completely fabricated, no castings, avoids contamination, simplifies cleaning

Uses: For blanching — or precooking — peas, lima beans, string beans, carrots, dried beans.

Features: Design follows recommendations made by National Canners Association Task Committee for "development of sanitary construction of blanchers". Entire blancher is completely fabricated and no castings are used. Instead of a sheet metal cylinder, fabrication is by means of a series of steel discs welded to the center shaft and notched for ¾" rods that are in turn welded to these discs. These rods are also notched for the inner edge of the screw but the screw rides free and is not welded to them.



Blancher's hinged doors, wide clearance between shell and cylinder make cleaning easy

Description: Product to be blanched is fed to the blancher through feed tube directly into cylinder. The 8" tube is placed at angle to prevent lodging. Tube is also tapered outwardly so that diameter at discharge end is somewhat larger than at intake end. Product is then picked up by discharge buckets. These drain off water and empty and discharge into discharge chute and then to succeeding equipment.

During its passage through the blanching cylinder the product is immersed or floats in the blanching medium which is held at a predetermined temperature by means of temperature controllers, one only usually being used

High-capacity, new sifter solves many problems
Dust-tight — can be made gas-tight!
Only from 28 inches to 45 inches headroom required!
Screen readily accessible for rapid cleaning!
Carbon steel construction — stainless steel parts available!
Write For Bulletin 160
RICHMOND / SPROUT-WALDRON
GYRO-SHAKER
It has proved itself highly successful in big-capacity applications and for handling materials such as sugar, starch, etc. Available with single screen areas ranging from 5 sq. ft. to 35 sq. ft. and up to 70 sq. ft. with two screens. Get details now.
SPROUT-WALDRON
Manufacturing Engineers Since 1866
25 LOGAN STREET, MUNCY, PA.
EQUIPMENT FOR SIZE REDUCTION, MIXING & BLENDING, PELLETING & CUBING, BULK MATERIALS HANDLING, PRODUCT CLASSIFICATION

When inquiring check 8332 opposite last page

STAPCO
IF IT WILL FLOW
Will-Flow
WILL PUMP IT!
Adhesives, inks, chemicals, foods and drugs of semi-solid or heavy liquid consistency are just a few materials efficiently transferred from one point to another through lines by Will-Flow Systems.
Pumped directly from drum-sized containers, materials are fully protected from contamination by Will-Flow. All parts in contact with the product are constructed of 18-8 stainless steel or similar materials. Models available to handle various capacities.
Will-Flow is fully automatic in operation and delivers materials to points of use at uniform pressures without spillage, wastage, or loss through evaporation. Improves plant housekeeping conditions and lowers material handling costs.
If it will flow, Will-Flow will pump it! Write for full information.
A Complete Engineering Service
STAINLESS PRODUCTS CORPORATION
BELDING, MICHIGAN

When inquiring check 8333 opposite last page

on 8" machine, and two on 12" or longer units. Product must follow through and out of discharge chute once it has entered the spiral. Thus, at any given rpm, all of the product must pass through the cylinder in a specified time.

Vertical construction parts are mainly tubular and sealed to prevent corrosion. Reel and frame are steel hot dipped, galvanized. Vented only at feed and discharge openings to prevent drafts and cool spots where bacteria grow. Cover is 10 gage aluminum sheet construction, all corners rounded.

(Rotary hot water blancher is built by Chisholm-Ryder Co., Inc., Dept. FP, 5380 Highland Ave., Niagara Falls, N.Y. . . . or check 8334 on form opposite last page.)

Spray problem aided by versatility of pilot-type dryer

Also useful in small runs of ordinary products

Uses: For pilot plant and semi-works requirements, unit is well suited to studies of spray drying problems and small production runs of ordinary products.

Features: Affords a versatility heretofore available only in custom-built units. This one spray unit can be converted quickly for use with viscous materials, for the production of hollow spheres or thin-walled "beads", or for applications requiring a "dispersion-type" dryer.

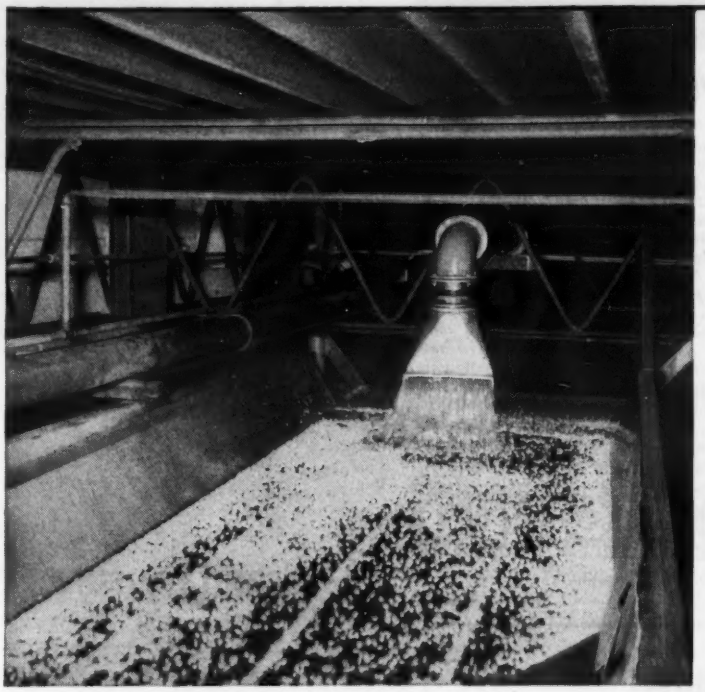
Description: Each model is available in two capacity ranges. Evaporation rates of the basic units are 15 to 75 and 30 to 150 lb water/hr, with increases to 200 and 400 lb water/hr possible with the "dispersion-type" dryers.

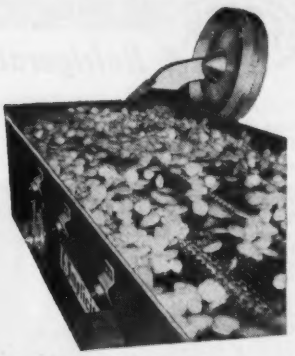
(Pilot plant and semi-works spray dryers are built by Proctor & Schwartz, Inc., Dept. FP, 7th St. and Tabor Road, Philadelphia, Pa. . . . or check 8335 on form opposite last page.)

SIMPLICITY

new developments in food screening

INFORMATION ON PROCESSING FOOD AND WASTE PRODUCTS





PICKLE SLICES—1% REJECTS

The 3′ x 8′ Simplicity 2-deck Pickle Screen was developed for both slices and relish. Bottom decks can be either a solid pan or screen cloth, with top deck opening to suit individual needs. The screen cloth is very effective for seed removal in relish stock.

One large operator reported that, after installing this screen, rejects dropped from six per cent (the average with hand picking) to one per cent or less with the Simplicity! Production is 135 bushels per hour, and can be further increased by use of spray bars. Available in several sizes, these screens are "a must" for producers who want to improve their product.

SIMPLICITY SCREENS DEWATER 3-4,000 LBS. VEGETABLES HOURLY

A major producer of frozen foods uses this 3′ x 8′ Model "C" single deck screen to dewater 4,000 pounds of corn per hour, using a hydro-pump with a capacity of 250 gallons of water per minute.

The stainless steel wire cloth deck has longitudinal slotted openings of 1/10" x 1". The same producer also uses this screen to dewater 3,000 pounds per hour of field run peas. The screen removes excess moisture from these products so effectively, that they are fed directly from the screen to a freezing belt.

SCALPING OVERSIZED MATERIAL FROM POWDERED COFFEE BRINGS ORDER FOR 2ND SIMPLICITY MACHINE

A large instant coffee producer is using a Model OA-10-52 3′ x 10′, totally-enclosed single deck flat screen for scalping oversize material from the product. The powdered coffee, weighing 15# per cubic foot is screened at a rate of 6,000 pounds per hour on the 14-mesh stainless steel deck. This machine proved so satisfactory that the company ordered a duplicate unit.

The Simplicity flat screen can be used for handling many food products, and is easy to clean. The two-shaft, oscillating assembly gives a positive feeding action, even if the screen is set on the horizontal.

Available in many sizes and models; you'll find one just right for your screening problem. Write today for details.

199

FOR THAT SEWAGE PROBLEM

Above is a typical Simplicity sewage screen installation. These screens are being used by food manufacturers throughout the United States for removing solids from their waste water. With the sewage problem increasing steadily, it will pay you to investigate these low-cost, low-maintenance units.

There is a unit size manufactured to suit every need, large or small. The 2′ x 3′ Model "C" will handle 250 GPM, a 2′ x 6′—400 GPM, a 3′ x 6′—600 GPM, and the 3′ x 8′ will handle from 800 to 1,000 GPM. Stainless steel cloth with 20, 30 or 40 mesh openings can be installed at customer's request.

Write for information on any of these pieces of equipment or for Bulletin FC-3

SIMPLICITY ENGINEERING COMPANY, DURAND 6, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A. • FOR CANADA: Simplicity Materials Handling Ltd., Guelph, Ont. • FOR EXPORT: Brown and Sites, 50 Church St., N.Y. 7, N.Y.

When inquiring check 8336 opposite last page

World's Largest Quick-Freezing Plant Finds

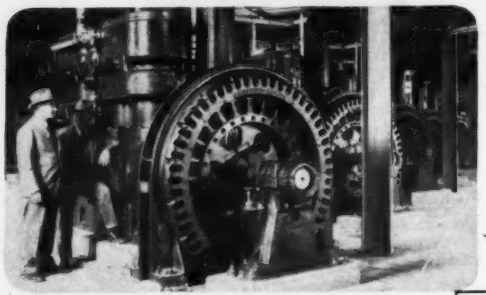
FRICK

Refrigeration Highly Dependable

Seabrook Farms, near Bridgeton, N. J., have been using Frick refrigerating equipment exclusively since 1929. Today, Seabrook operates 22 Frick compressors. Of these, 12 are heavy-duty 4-cyl. machines, with 12-in. stroke. Total refrigeration horsepower is over 5000. Belford Seabrook, vice president in charge of engineering, writes about the excellent service record made by these big machines, several of which are in continuous operation, day and night, most of the year:

"Figured on the original investment in these compressors, the annual cost of repair parts, including their installation, is averaging only 1 per cent." Other users have had Frick compressors in continuous operation for four to six years without even opening the machines!

If you want the last word in reliable refrigeration, specify Frick equipment, and accept nothing less.



Belford Seabrook, Operating Vice President, checks the performance of the Frick compressors.

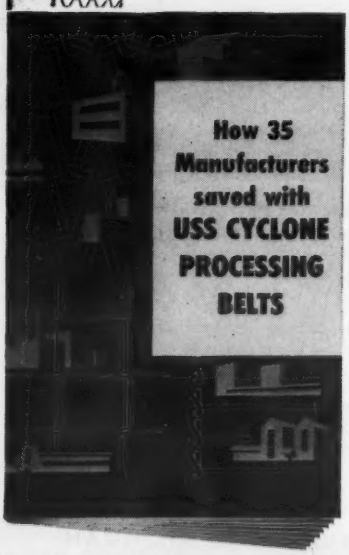
DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA., U.S.A.

When inquiring check 8337 opposite last page

Learn how CYCLONE conveyor belts improve production pictures



Now you can learn how 35 manufacturers have profitably put USS Cyclone Processing Belts to work on their production lines. Taken right from our sales files, these capsule case histories are examples of manufacturers improving quality, reducing breakage, speeding up production, and cutting costs . . . all with the help of Cyclone Belts. Send us the attached coupon and we'll send you your copy of this informative booklet, free.

Cyclone Processing Belts *are engineered for each specific situation.* Available in stainless or carbon steel, Cyclone Belts, in various sizes, types and finishes, can be fabricated to fit your exact need. Learn about them, now.

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
WAUKEGAN, ILLINOIS

MAIL THIS COUPON TODAY

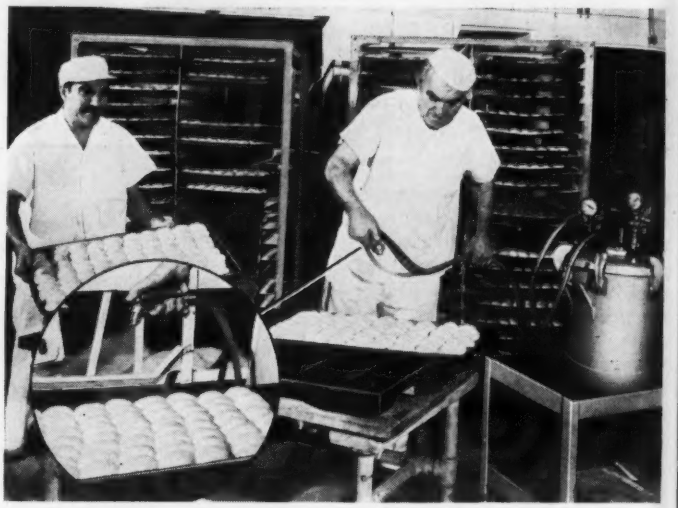
Cyclone Fence, Dept. K-67
Waukegan, Illinois

USS

Name .....
Company .....
Address .....
City ..... State .....

UNITED STATES STEEL

When inquiring check 8338 opposite last page



Hand-operated gun used in bakery to spray egg wash on buns. Task is completed in fraction of time needed for hand brushing

sanitary spray gun for glazes coatings egg washes

Liquid coatings can be sprayed 5 to 14 time faster than hand brushing — with better sanitation

Although attempts have been made at using conventional spray gun equipment in commercial bakeries, these implements have been unsatisfactory from a sanitary standpoint. One manufacturer, however, has now met this problem with the first spray gun designed with sanitary principles and approved by the New York Dept. of Health.

The new gun will apply coatings, egg washes, glazes, butter, and will grease baking tins, etc.

Although designed for hand use, a simple revision will

Simple revision converts hand gun into automatic line unit. One automatic spray gun handles full pie machine production

convert the unit into an air-operated automatic unit that can be triggered by an electric impulse to a three-way solenoid valve, or by a compressed air valve alone. Sanitary pump is available to reclaim coatings that do not reach the item being sprayed and return them to reservoir.

High-speed spraying

Among advantages offered by spraying is the high rate of application. Liquid coatings can be sprayed 5 to 14 times faster than hand brushing. Pans and dough troughs can be sprayed in a fraction of the time needed for swabbing.

Stray brush bristles are eliminated, and old pastry cannot be carried back into the fresh coating supply. Spraying also allows keeping the coating in a closed container, giving further protection from contamination.

Material savings are implied since the spray gun can apply a more-uniform film, without the usual missed spots and resultant sticking.

Sanitary regulations

In order to meet strict sanitary regulations for food use, a number of important considerations were designed into the spray gun and accompanying equipment:

1. All surfaces coming in contact with food completely visible.
2. Fabricated of stainless steel, aluminum, or transparent tubing.
3. Surfaces smooth and polished; no crevices to collect decaying food.
4. Threads exposed and easily cleaned.
5. No dead end holes; all visible from both ends.
6. No tools needed for disassembly and cleaning.

(San-rod spray gun is manufactured by Eclipse Air Brush Co., Dept. FP, 390 Park Ave., Newark 7, New Jersey . . . or for more information reader may simply check 8339 on the convenient Reader Service slip which is located opposite last page.)

LUDFORD FRUIT PRODUCTS INC.

1411-21 SOUTH WESTERN AVENUE, LOS ANGELES 6, CALIFORNIA

Morehouse-Cowles, Inc.
1150 San Fernando Road
Los Angeles 65, California

Attn: Mr. D. L. Grubbs

Gentlemen:

For over 10 years our SS-25 Morehouse Mill has been grinding out true fruit flavoring extracts -- 6 hours a day, 5 days a week. In this entire time we have not lost 10 minutes for repair.

The mill gives us control of the fine, uniform particle size we need, and turns out a big volume of emulsions that remain stable up to 3-4 years. We use it on a wide variety of materials. The Morehouse is very definitely the most dependable machine available -- and we've tried them all.

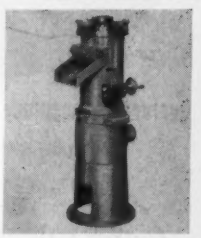
Our new 10D Cowles Dissolver has replaced three ordinary mixers and homogenizers, and given a 60% increase in solid-liquid dispersion volume as well. We have never seen anything to equal the Cowles. Even our little 1VG Cowles laboratory model is used for production as well as pilot work.

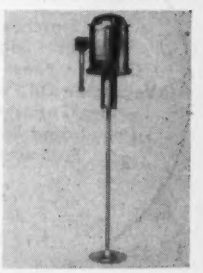
The mill, teamed with the large dissolver, gives us a further big increase in production, and very economically. We are convinced that in these two machines we have the most versatile, big-volume production system we can get.

Thought you'd like to know that we appreciate the good service, too.

Sincerely,
Ludford Fruit Products Co., Inc.

Paul Ludford.





"...most versatile, big volume production system"

Above — Morehouse Mill, Stainless Steel Model SS-25

Right — Cowles Dissolver Unit 10D

. . . this Morehouse Mill-Cowles Dissolver production record can show you the way to greater profits. Read the pointed remarks above by a prominent processor of flavoring extracts.

WHAT CAN YOU EXPECT OF THESE MACHINES?

From your Morehouse Mill – four times the speed for grinding meats, fruits, peanut butter, vegetables and similar products. Complete control of grind size – no contamination – more uniform, stable end-product.

From your Cowles Dissolver – faster production, improved quality, higher yield, lower power consumption – up to 2½ times the speed for ultimate dispersion on liquid-liquid, gas-liquid or solid-liquid products: foods, beverages, condiments, drugs, pharmaceuticals.

From your Morehouse and Cowles TEAM – up to 10 times the production volume of ordinary machines.

LET US PROVE IT IN YOUR PLANT—AT OUR RISK!

MOREHOUSE® COWLES®

Write today for complete details

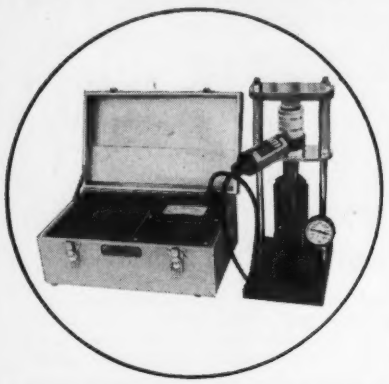
Morehouse-Cowles, Inc.
1150 San Fernando Rd.,
Los Angeles 65, Calif.

Distributors in Principal Cities

5710

When inquiring check 8340 opposite last page

Moisture Costs Money!



Save the high costs of too much or too little moisture. Measure moisture content quickly, economically with **Granular Moisture Register G5**—insure product uniformity and quality!

1 minute test! No stopping for time-consuming, expensive laboratory tests.

Accurate readings to 0% within close tolerances!

Use on production line! Voltage regulated electronic power supply, or battery operated. No skilled technicians required.

Two Weeks Free Trial! Test the G5 in your plant. No obligation. Satisfaction is guaranteed.

Guaranteed accuracy on these products!

Starches • Flours
Meals • Sugars • Feeds
Coffee • Yeast • Baking Mixes
Vegetable Oil Products • Cereals
Dry Grains • Dried Eggs
Dehydrated Foods • Walnuts
Parmesan Cheese

ELECTRONIC MOISTURE REGISTER *Instruments*

Moisture Register Co.,
Dept. FP, 910, Alhambra, Calif.

☐ *We are interested in 2 weeks free trial offer. Send additional information regarding Model G5.*

*We will want to test*_____
*in a moisture range from*____% to____%.
Firm Name_____
By_____ Title_____
Address_____
City_____ State_____

When inquiring check 8341 opposite last page

processing

Stainless portable pump weighs only 35 lb

Submersible unit has capacity of over 3000 gph

Uses: For disposal of various materials from containers or wherever transfers of liquids are necessary.

Features: Unit is constructed entirely of 304 and 316 stainless steel. It is portable, and weigh only 35 lb.

Description: Submersible pump measures 12" in diameter, and is 14" high. It has 1¼" discharge and capacity of over 3000 gph against heads up to 21 tdh. Motor is 1/3 hp.

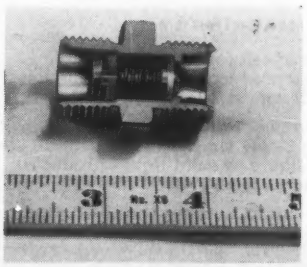
(Submersible pump is product of Neptune Pump Mfg. Co., Dept. FP, 4912 N. 6th St., Philadelphia 20, Pennsylvania . . . or for more information reader may simply check 8342 on the convenient Reader Service slip which is located opposite last page.)

Aluminum, SS, or titanium used in check valve

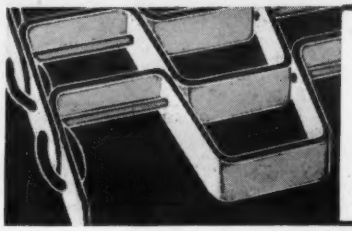
Teflon washer used as sealing member

Uses: Valve has application in food and beverage processing, vending machines, and other type of circuits where fluids or gases are in motion.

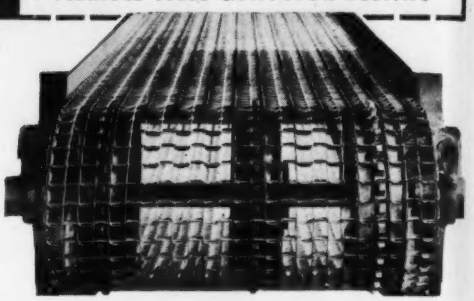
Features: Check valves are reportedly 85-90% lighter in weight than conventional valves of similar type. Alloys of aluminum, stainless steel or titanium are used. Teflon washer is the sealing member of valve; is chemically inert. This washer can be used in



Check valve uses lighter weight materials of construction



Engineered
for EVERY Process
LA PORTE
FLEXIBLE STEEL CONVEYOR BELTING



Food moves smoothly through freezing, cooking and dehydrating processes on this all-process conveyor belting that costs less, wears longer, and requires less maintenance.

The open-mesh construction assures a positive drive on the sprocket, provides for fast drainage, permits free circulations of air around products in process, prevents waste accumulation, protects your products against odors and off flavors, and makes sterilizing with a steam gun or scalding water simple and easy.

If you process, package, ship, or store food products this is the belt for you. Available in ½" x 1" also 1" x 1" in any length and practically any width.

LA PORTE

Ask your Mill Supplier or write for illustrated literature, prices.

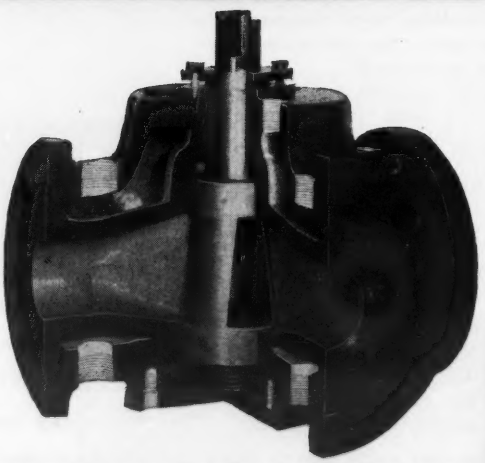
MAT AND MFG. CO.
BOX 124 *Dept. A* *La Porte, Indiana*

When inquiring check 8343 opposite last page

H&B ESTABLISHED 1887

Jacketed Spring Loaded
PLUG VALVES

- **2-WAY OR STRAIGHT SPRING LOADED**
- **3-WAY SPRING LOADED**
- **ANGLE SPRING LOADED**
- **AIR CYLINDER OPERATED SPRING LOADED**—*all sizes and types*



LONG ON SERVICE : : : SHORT ON MAINTENANCE

H & B's new fully jacketed spring loaded plug valves feature an inverted tapered plug inserted and lapped into the housing from the bottom of the valve—then spring loaded. The spring wedges the plug to a perfectly tight seal, eliminating troublesome leaks. Easy to operate—no big handwheel . . . no freeze . . . no "breaking loose" necessary. Easy to clean. Made in two port or multi port design, with any special stop arrangement desired.

Bulletin J-57 sent on request

HETHERINGTON & BERNER INC., 757 Kentucky Ave., Indianapolis 7, Ind.

When inquiring check 8344 opposite last page

PALMER

presents

an outstanding improvement in

DIAL THERMOMETERS

external calibration

Full 3½" Dial Face

- **No Sector**
- **No Pinion**
- **No Linkage**
- **Constant Accuracy**
- **Easy Readability**

WRITE FOR BULLETIN 350

PALMER
THERMOMETERS, INC.
Norwood Ave., Cincinnati 12, Ohio
Mfrs. of Industrial Laboratory Recording and Dial Thermometers

When inquiring check 8345 opposite last page

temperature range of −60° to +400°F without adverse effect. Pressure range of the valve is 0 to 5000 psi.

The concentricity between the conical seat of the valve and the poppet is held to a high degree of accuracy. Also it secures a perfect peripheral contact between the sharp edge of plastic and the seat of the valve. The normal opening pressure of the valves is 6 ± 2 psi.

Description: Lightweight check valve incorporates sharp-edged plastic washer which is inserted in the valve poppet sealing against the conical seat. Two metal parts of the poppet, with the plastic washer in between, are riveted together.

(Micro Check Valve is manufactured by Integral Corp., Dept. FP, 100 Frank Rd., Hicksville, L.I., N.Y. . . . or for more information check 8346 on form located opposite last page.)

Non-swelling filter removes vapors

Uses: Removing oil vapor and moisture from compressed air and gas lines.

Features: Absorbent cellular filter material will mop up moisture and oil vapors without swelling or increasing in particle size. It will absorb up to 87% of its weight in water and 79% of its weight in oil.

Description: Air filter is available in six models of varying capacities. Container is tempered, clear plastic which shows visibily when filter elements are exhausted and when to drain water. Elements are simply replaced with thumb screws or a wrench. Reduction in flow of compressed air or gases through filter elements is negligible. Actual line drop is 3 to 7%. Compressed air which has passed through filter reveals no foreign matter under a magnification of 250 times.

(Sta-Dri filter is a product of Beach Precision Parts Co., Dept. FP, Boonton, N.J. . . . or for more information check 8347 opposite last page.)

RIGHT!

KINNEY SPANS THE WHOLE SUBJECT OF HIGH VACUUM . . .

The most comprehensive line of High Vacuum Pumps in the World—that correctly states the position of KINNEY in the High Vacuum field. These Pumps embrace two-stage Mechanical Booster Pumps that produce a clean, dry Vacuum to 0.10 micron, as well as single-stage simplex Pumps with ultimate pressures to 10 microns. It is quite safe to say that whatever YOUR Vacuum Pump problem KINNEY Pumps hold the answer.

ARE KINNEY PUMPS TOO GOOD FOR YOUR PURPOSES?

The fact that your application doesn't require an ultra-high vacuum does not necessarily indicate that KINNEY quality, KINNEY long service life, KINNEY superior performance should be denied your product or process. Consider the factor of rapid recovery and the possibility of faster cycles. Consider the factor of dependability and freedom from down-time. Consider KINNEY Engineering experience, "know-how" and service. There's no question but that KINNEY High Vacuum Pumps ARE TOO GOOD in many situations where a low vacuum will do. It will pay to check the economics with a KINNEY engineer before you buy.

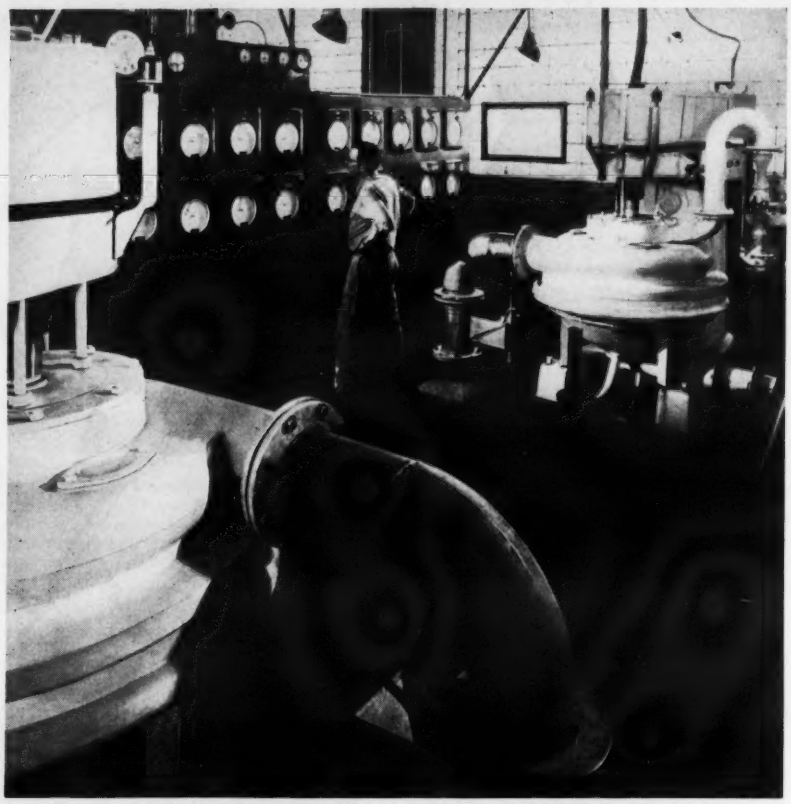
WRITE: for catalog 425A of KINNEY High Vacuum Pumps and High Vacuum Valves—use this coupon.

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3571F WASHINGTON STREET • BOSTON 30 • MASS.

Gentlemen:
Please send me Catalog 425A by return mail.

Name_____
Company_____
Address_____
City_____ Zone____ State_____

When inquiring check 8348 opposite last page



Two of the Merco Centrifuges installed at Clinton Corn Processing Company

Better Starch at Clinton with **Merco Centrifuges...**

At Clinton Corn Processing Company, a Division of Standard Brands Incorporated, fifteen Merco Centrifuges of three different designs give increased recovery of a higher quality starch . . . at reduced processing costs. The first unit was ordered in 1937, and today Merco Centrifuges are used at Clinton for a two stage Primary Separation system and for Gluten Thickening.

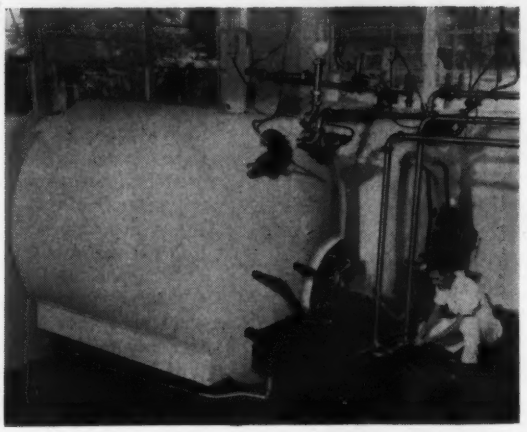
In addition to the Merco Centrifuges, Clinton has recently ordered a battery of TM DorrClone clarifiers, newest development in centrifugal equipment for the starch industry. These units will be used for filtrate clarification and thickening of recovered filtrate.

For more information on Dorr-Oliver centrifugal equipment for wet separations, write Dorr-Oliver Incorporated, Stamford, Connecticut.

DorrClone, Merco, T.M. Reg. U.S. Pat. Off.

DORR-OLIVER INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

When inquiring check 8349 opposite last page



Note—no pumps here. Oil-free air forces milk from these two 1000-gal surge tanks

Move milk with compressed air instead of centrifugal pumps

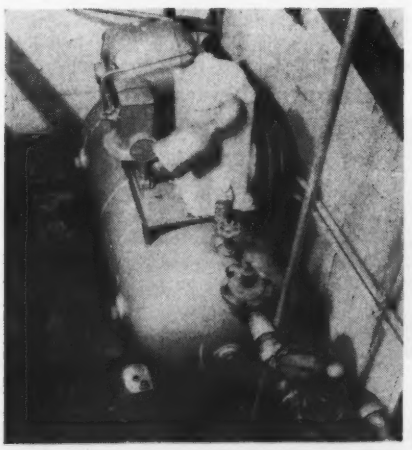
Operates 10 hours a day, 7 days a week—doesn't 'churn' the milk; hasn't failed in 3 years

Oil-free air is being used at the Harrisburg Dairies, Inc., Harrisburg, Pa., to replace two centrifugal pumps for milk and milk products. Air pressure from a small compressor, remotely located, has handled approximately 110 million lb of milk from storage tanks to filling equipment in the last three years of operation.

Compressor has one, non-lubricated cylinder with a 1 hp motor—and has required no maintenance over the three year span. It has not failed once.

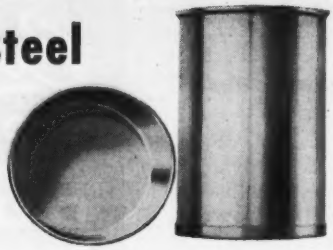
Compressor operates at mere 7 psi, is used over a 10 hour day, 7 day week the year 'round . . . a total of 11,000 hours without breakdown.

An added advantage—time



Instead of pumps, this air compressor, located out-of-the-way, moves milk

stainless steel food container



Hackney *Stainless Steel* Containers protect food batches against contamination . . . are always easy to clean . . . give you low-cost, trouble-free service for many years. Available in 30-, 50- and 55-gallon capacities. Other sizes available, depending on quantity. Furnished with or without covers. Write for specifications.

Here is the famous Hackney Seamless Bottom Head with smoothly welded chime that positively eliminates interior cracks and crevices — makes cleaning so easy.

Hackney

PRESSED STEEL TANK COMPANY
1459 South 66th St., Milwaukee 14, Wis.
Manufacturer of Hackney Products

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check 8350 opposite last page

WE WANT TO BUY A GROCERY-STORE PRODUCT

Nationally advertised food product manufacturer—with complete national distribution—interested in buying outright a going manufacturing business—or a promising product—that can be sold through the food trade. Write in confidence. Our organization knows of this advertisement.

BOX F.P. 201

c/o Food Processing, Putman Publishing Company
111 East Delaware Place, Chicago 11, Illinois

is saved by eliminating set-up and take-down time for pumps.

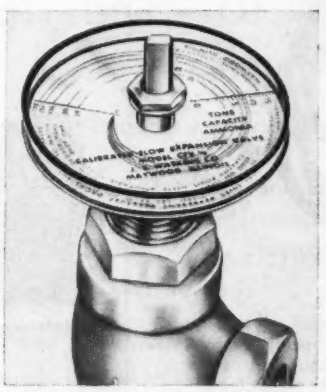
Air pressure enters tops of two 1000-gal surge tanks, forces pasteurized milk out of tanks, through overhead pipes to the filling machines. Milk is handled at rate of about 66 gpm. Skim and buttermilk are handled in this way.

(Oil-free air is supplied by compressor manufactured by Ingersoll-Rand Co., Dept. FP, Phillipsburg, N. J. Check 8351 opposite last page.)

Disc guides setting of expansion valve

Set opening for tonnage as controlled by pressure drop through valve

Calibrated discs are featured on a series of hand expansion valves. These permit setting the valve opening for the rated tonnage of a cooling or freezing coil, as controlled by the pressure drop through the valve.



Valve — ½" size — with calibrated disc

For example, model for ½" valve, illustrated, has ½" connections and can be set for ammonia evaporators rated from 1 to 18 tons at the existing pressure drop.

("Cali-Flo" calibrated expansion valves are manufactured by J. E. Watkins Co., Dept. FP, 307 Lake St., Maywood, Ill. . . . or check 8352 on form opposite last page.)

5 GPM to 2800

Whatever your liquid handling needs your problem can be solved by specifying an

Ingersoll-Rand MOTORPUMP

In this complete line are centrifugal Motorpumps from ¼ to 75 hp . . . capacities from 5 to 2800 gpm . . . heads to 650 feet!

Write for latest catalog with complete data needed to choose a Motorpump.

INGERSOLL-RAND 11 Broadway, New York 4, N. Y.
9-371

When inquiring check 8353 opposite last page

PRESSURE CLEAN WITH . . .

cold steam

- BLASTS STUBBORN DIRT
- HARMLESS TO FINEST FINISH
- NO BACK SPLASH

HYDRO-AIR
PRESSURE WASHER

You can save time, money and manpower with HYDRO-AIR pressure-cleans tanks, blenders, mixers, cookers, racks, separators, homogenizers, pasteurizing equipment, air filters, dry feeders, bag fillers, trucks and other equipment. Connects to regular air and hot or cold water outlets.

$9.95

Composition rubber sleeve is furnished to protect user's hand when hot water is used.

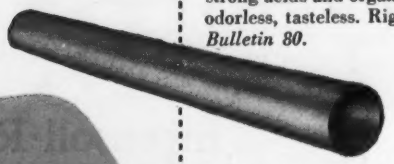
ORDER THROUGH YOUR SUPPLIER

D & M PRODUCTS, INC.
26 N. RAYMOND AVE. PASADENA 1, CALIF.

When inquiring check 8354 opposite last page

TOUGH ACE-ITE PLASTIC PIPE

General-purpose moderately priced rubber-plastic pipe handles most common chemicals to 170 deg. F. . . . except few strong acids and organic solvents. Tough, odorless, tasteless. Rigid pipe ½" to 6". *Bulletin 80.*



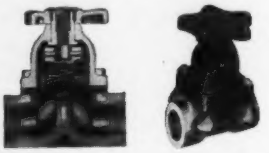
ACE offers 100 years experience to

STOP CONTAMINATION

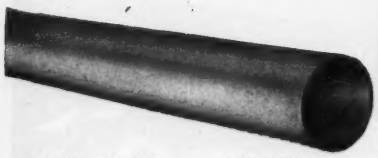
To prevent discoloration, taste, odor or metallic pick-up in your processes, you'll find the best, most economical piping, pumps, valves and tanks among the many ACE rubber and plastic materials. Wide range of temperatures, pressure, impact resistance. Phone nearest American Hard Rubber Company distributor, or write for Technical Data CE-50.

VALVES

for all-plastic piping systems



Trouble-free plastic diaphragm valves . . . choice of general-purpose ACE-ITE, ACE PARIAN (polyethylene) or ACE SARAN. Handles most corrosive chemicals and food ingredients. Sizes ½" to 2", 50 psi. at 77 deg. F. *Bulletins 80 and 351.*



RIGID VINYL . . . STRONG. AGE-PROOF

ACE RIVICLOR is a new rigid threaded plastic pipe with good aging and high impact strength. Not affected by most inorganic acids and alkalis, also excellent for many organics. Sizes ½" to 4". *Ask for Bulletin CE-56.*

1001 USES for ACE-FLEX Tubing

Excellent chemical-resistant, all-purpose flexible plastic tubing. Sparkling clear, easy to clean, odorless, non-toxic, can be steam-sterilized. ⅛" to 1" ID. *Bul. 66.*

ACE processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY

93 WORTH STREET • NEW YORK 13, N. Y.

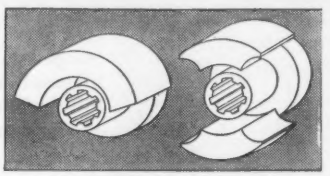
When inquiring check 8355 opposite last page

processing

•

Versatile sanitary pump now handles solids

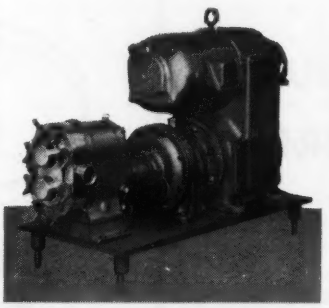
New models of positive displacement pumps will handle solids, such as strawberries, meats, and cheese curd. A single blade-impeller is used in place of double bladed.



Single-blade impeller (left) rather than standard twin-blade (right) permits handling of solids without break-up

Pumps also now come with side-mounted intake, to increase the range of viscous materials it will handle. Product enters directly into the pumping chamber, eliminating all restrictions to flow through inport side.

Maintenance costs have been cut by such features as a reusable head gasket, and a sleeve over the main wear point on the shaft. An inexpensive replaceable O ring rides on the sleeve, which is replaced when worn. This saves shaft machining or replacement costs.

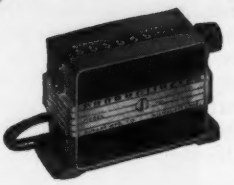


Intake is direct to pumping chamber

Pump will handle higher operating pressures than before, with positive shaft sealing from 150 psi to 29-in vacuum.

(Pump described is manufactured by Waukesha Foundry Co., Dept. FP, Waukesha, Wis. Check 8356 on form opposite last page.)

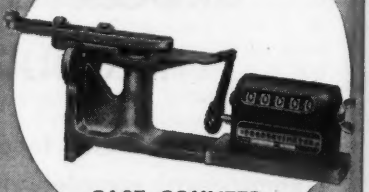
Count ALL PRODUCTION with accurate, dependable DURANT PRODUCTIMETERS



ELECTRIC COUNTER

HEAVY DUTY STROKE ACTION

BOTTLE AND CAN COUNTERS



CASE COUNTER

Eliminate profit-eating losses . . . Productimeters register accurate count of every unit processed . . . insure economical plant operation and maximum use of man hours.

DURANT MANUFACTURING CO.

Send for CATALOG 51-55

1951 N. Buffum St., Milwaukee 1, Wis.
51 Thurbers Ave., Providence 5, R.I.
Representatives in Principal Cities

PRODUCTIMETERS SINCE 1879 Count Everything

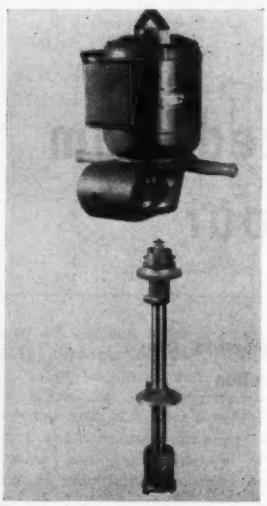
When inquiring check 8357 opposite last page

Quick-change heads on mixing unit avoid downtime

Shear-action design contributes to fast, complete dispersion

Features: Removal of four retaining bolts, and loosening of drive belt, disengages mixing head, permitting quick attachment of new one. Complete head assembly is a compact self-contained unit. It embodies mixing, shafts, stator-housing, counter-rotating impellers, seals, and related parts.

Description: Heads are made in a selection of sizes and hp ratings. The two impellers and the stationary stator are placed closely together. Impellers are counter-rotating. The shearing action taking place results in a very satisfactory dispersion of materials. Material is drawn from bottom continuously, aiding thorough mixing and minimizing incorporation of air. However, addition of air can be closely controlled where its need is indicated. Adjustment of deflector plate provides a variety of flow patterns.



Head changed by removing bolts, loosening V-belt

(Shear-Flow mixers are a development of Gabb Special Products, Inc., Dept. FP, Windsor Locks, Conn. . . . . or check 8358 opp. last page.)

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says **ALFRED E. PERLMAN**, President, New York Central Railroad

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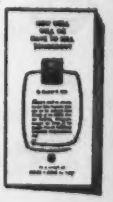


Write for a list of the NPB publications and the "Here's How" booklet, "How Well Will We Have to Sell Tomorrow?", written by Ralston B. Reid, Advertising & Sales Promotion Manager of the Apparatus Sales Division, General Electric Company.

depend on this valve

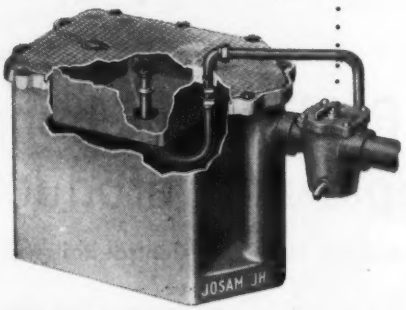
instead of costly labor

to solve your

GREASE PROBLEMS

• GREASE from your daily dishwashing can cause untold trouble and expense in your drain lines—yet this problem can be solved at "the turn of a valve." The JOSAM series "JH" Grease Interceptor intercepts over 95% of the grease in waste water, and, by means of the draw-off valve, delivers it, relatively free of impurities, to a storage container. You never need to remove the cover of the interceptor—and there's no mess, no inconvenience, no odor, no clogged drain lines! This results in substantial savings in labor and expense.

Now, there is no need to risk citations from your local health authorities . . . or the expense and inconvenience of pipe line "stop-ups" because of grease when it is so easy to install



Josam series "JH"

GREASE INTERCEPTOR

with automatic grease draw-off

Get all the answers to your grease problems by sending coupon today for free copy of Manual "W".

JOSAM MANUFACTURING COMPANY

General Offices and Manufacturing Division
Michigan City, Indiana

Josam products are sold through plumbing supply wholesalers.

JOSAM MANUFACTURING COMPANY
Dept. FP-6, Michigan City, Indiana
Please send free copy of Manual "W"

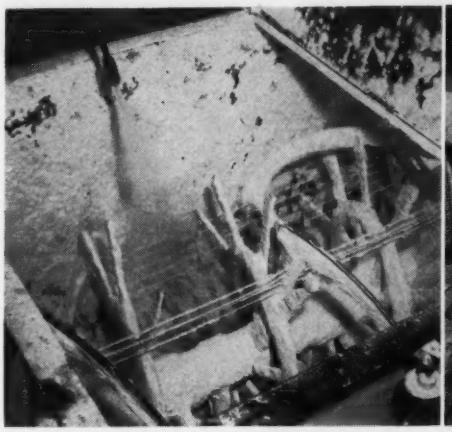
Name .....

Firm .....

Address .....

City ..... Zone ..... State .....

When inquiring check 8359 opposite last page



BEFORE: Here's how the inside of a dry-mix blender looks before cleaning. Paddles, wheels, wires, all are covered with gummy dough mixture. Steam has just started from cleaner lance which is at upper right of photo.

AFTER: Just a few minutes of steam cleaning have cut dough off much of the blending mechanism and one interior wall of the blender. The operator continues until the whole blender inside is spotless

Cleaning time reduced from 4 hours to 1 hour

Mobile, self-contained, electric powered steam generator does better job with minimum water consumption

Problem: Blenders of a blending-mix plant must be cleaned daily, as any materials left in them could sour and ruin following mixes. The dough remaining in the mixers — see photo — is a sticky mass. Inaccessible areas and odd shapes of the mixing blades made cleaning by hand scraping and brushing difficult. It took at least four man-hours of messy labor to do the job in a plant of a large manufacturer located in the East.

Solution: Cleaning with steam has the advantage of using a minimum of water. Use of a mobile, self-contained steam generator eliminates the necessity of having plant source of steam when the cleaning is conducted. Electric generation of steam has the advantage of instant automatic regulation for supplying steam as demanded.

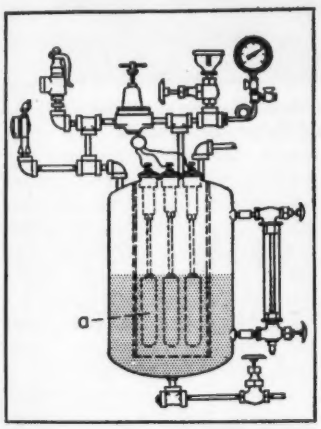
Now blenders are cleaned both inside and out with steam. A detergent applied along with the steam by a controlled aspirating device on the generator aids in removing the gummy deposits that adhere tenaciously. Detergent is then rinsed off with dry steam. After steam cleaning is completed, the interior of the

Steam cleaning of floors and walls brings them to standards of cleanliness that easily satisfy the most particular of inspectors

blender is dried with a compressed air blast to avoid possibility of rusting. Outside of the blender is then cleaned in the same way. Total cleaning time is only an hour, and the job done is considerably better than obtained by hand.

Steam cleaning has many applications

The jet cleaner does other important cleaning jobs too. Each week every fork-lift truck in the plant is steam-



Passage of current from the electrodes (a) through the water (shaded area) generates heat and creates steam. When the amount generated exceeds demand, the water level falls, reducing the immersed area of the electrodes and consequently the amount of electricity consumed and amount of steam generated until the system is in balance

cleaned to make sure that they introduce no contaminants into the raw materials and processed mixes they handle. Cleaning them with steam removes all the dirt than commonly collects on such trucks and also any oil and grease that might drip on bagged flour being hauled into the blending room or packaged products being taken to storage or loaded onto highway trucks for delivery.

Cleaning floors and walls also has been speeded up as we now use steam cleaning to supplement the regular cleaning methods. On humid days,

(*Turn to page* 120)

Uniform particle size is the key to uniform cleaning power

Ordinary cleaners have ingredients varying in size from fine dust to large granules. In normal jarring, bouncing and shaking a drum goes through in shipment, the run-of-the-mill cleaner separates out by particle size . . . large granules come to the top while the powders sift to the bottom.

That's why men who buy cleaners look to Diversey DIO-MIXED cleaners . . . the products that are uniform throughout. Each granule is the same size so there can be *no separation of ingredients*. Every scoopful contains *precisely the same cleaning power*. You can accurately determine how much cleaner is needed then make every solution the same way and obtain the same outstanding results. From the top of the barrel to the bottom, DIO-MIXED cleaners eliminate "the extra scoopful for good measure".

Look into DIO-MIXED cleaning compounds and see how uniformity of particle size can mean lower costs through minimized waste and more dependable cleaning results. Write today for more information, or call your local Diversey D-Man.

Here are cleaners made by the DIO-MIX process:

DIFLEX—concentrated cleaner for all water hardnesses

DIVOLUXE—hard working cleaner for all metals (including aluminum) in moderately hard water areas

D-LUXE—outstanding cleaner in soft to moderately hard water

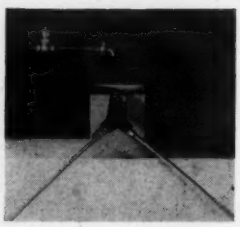
1820 WEST ROSCOE STREET, CHICAGO 13, ILLINOIS

DIVERSEY.®

DIO-MIXED CLEANERS

When inquiring check 8360 opposite last page

Three ways to lubricate and clean conveyor chains—*while they run!*



Oakite Chain Lubricator
Water feeds into top of this unit, dissolves jelly-like Oakite Composition No. 6. Solution then drips on conveyor surfaces.

Oakite Roller Lubricator
For use with Oakite Composition No. 6, a soapy cleaner-lubricant, or with Oakite No. 12, a non-soapy lubricant. Conveyor chain powers the roller.

Oakite Drip Tank
Using Oakite Composition No. 12, provides uniform lubricating film. Rate of application easily controlled. No water connection needed.

These three Oakite dispensers for chain lubrication are speeding cans, jars and bottles by the millions on food production lines. They are furnished on free loan to regular Oakite users.

When you match a specialized Oakite lubricant to your particular operation you get exactly the right "slip" for product flow. You eliminate snags and breakage. And you cut conveyor maintenance time and costs because chains stay bright and clean.

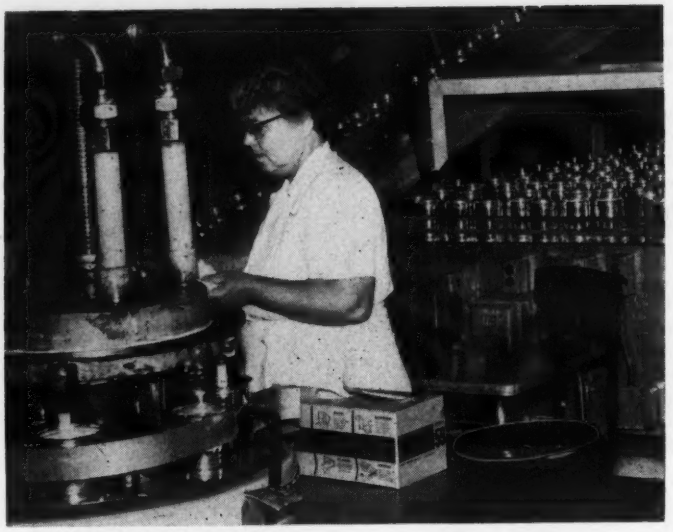
For a FREE copy of the Oakite booklet, "How to Lubricate and Clean Conveyor Chains While They Work", call your local Oakite Technical Service Representative, or write to Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

When inquiring check 8361 opposite last page



Spigots of filling machine for Snowdrift shortening are constantly kept clean with paper wipers at Southern Cotton Oil Company

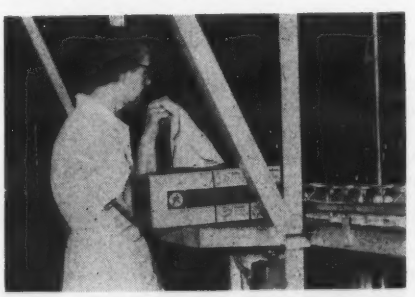
Paper wipers cut costs 25%, promote plant sanitation

One-use feature forestalls using soiled materials for clean-up. No 'oily rag' storage nuisance

P. A. WILLIAMS, Vice President
Southern Cotton Oil Company
as reported by **FP staff**

At our Memphis plant—where we package Wesson Oil and Snowdrift shortening—keeping equipment scrupulously clean is, and always has been, a "must". As the world's largest processor of edible cotton oils, our engineers have to maintain highest hygenic standards in all plants. So they are always on the lookout for ways to simplify the tremendous operation that supplies the nation with Wesson Oil, Snowdrift, and our other commercial and industrial shortenings.

We had used wiping cloths



Pop-up feature, and strategic location of paper wipers help promote cleanliness

for years, but they were not completely satisfactory. First of all, the initial investment was high. Then, there was a certain amount of loss and replacement to consider.

Workmen were frequently tempted to use the cloths beyond the limits of cleanliness. They had to be provided with separate hand cloths.

About a year ago, a 90-day test was begun with a disposable paper wiper made for industrial use. Although there was a small amount of opposition from our employes at the beginning, well before the test period was up they were as enthusiastic about the paper wipers as our accounting department.

In the first place, we found that paper wipers save 25% of our wiping bill. Because they are disposable, there's no temptation to use them beyond their limits of serviceableness. A pop-up feature makes them easy to use. They are extremely absorbent, and retain oil and moisture well.

Though we had feared storage would be a problem, we find a six month's supply fits in our store room easily. And there's none of the fire-hazard involved in storing the oil-soaked cloth wipers for the laundry to pick up.

(Disposable industrial wipers used at this operation are manufactured by Scott Paper Co., Dept. FP, Front and Market Streets, Chester, Pa. . . . or for more information check 8362 on form opposite last page.)

"Cheers"

WESCODYNE® cleans as it disinfects

for less than two cents a gallon

FOR ALL AREAS

WESCODYNE is a completely new detergent-germicide that contains amazing "Tamed Iodine"®. Increases germicidal capacity three to four times and offers a much wider range of effectiveness than solutions containing chlorine, cresylics, phenolics or quaternaries.

WESCODYNE is also an excellent detergent as well as a powerful sanitizer and disinfectant. Provides fast cleaning action as it disinfects. A time and labor saver.

. . . all at a cost of less than 2¢ a gallon at use dilution!

WESCODYNE is nontoxic, nonstaining and nonirritating to the skin when used as directed. Further, it contains an exclusive "built-in" safety feature. In use, its amber color guarantees the presence of germicidal activity. When this color disappears, a fresh solution must be used. You're always sure of germicidal action!

WESCODYNE is used by leading hospitals throughout the U.S.A. Complies with U. S. Public Health Service recommendations. Leaves no odor. Recommended for almost any sanitizing or disinfecting procedure. Interested? Send the coupon.

LARGEST COMPANY OF ITS KIND IN THE WORLD

WEST DISINFECTING Company

WEST DISINFECTING COMPANY, 42-16 West Street, Long Island City 1, N. Y.
Branches in principal cities • In Canada: 5621-23 Casgrain Ave., Montreal

☐ Please send full information on Wescodyne.
☐ Please have a West representative telephone for an appointment.

Name.....

Position.....

Mail this coupon with your letterhead to Dept. 23

When inquiring check 8363 opposite last page

For Faster and Better Clean-Up

USE

KLENZADE

DETERGENTS AND BACTERICIDES

CBS CLEANER
Exceptional emulsifying and saponifying powers scientifically balanced with rapid-action wetting agents for thoroughly removing stubborn fat and soil deposits. Ideal for hand cleaning of cookers, vats, fillers, etc. Rinses clean and bright. Tops in its field.

KLENZADE HC-6
Highly popular general cleaner especially useful on all wood and metal surfaces, tile, concrete floors, general processing equipment, ovens, hoods, etc. Rapid removal and dispersion of grease and heavy soil. Leaves no scum; rinses freely. Safe for hands.

FLASH-KLENZ
Non-corrosive organic acid detergent for cleaning high temperature equipment. Completely neutralizes and removes baked-on mineral deposits. The latest scientific approach to lime or "stone" dissolution. Eliminates abrasive methods.

KLENZADE XY-12
Concentrated sodium hypochlorite solution for bactericidal use in food plant operations. Rapid and effective for sanitizing all types of equipment. Clear solution, always ready for use. No dissolving or settling necessary. Leaves no sediment or residual film.

SPECIAL DETERGENTS
and equipment for high temperature and heavy duty cleaning. Also fog sanitizing equipment and steam pressure cleaning.

Offices in Principal Cities

KLENZADE PRODUCTS, Inc.
BELOIT, WISCONSIN

When inquiring check 8364 opposite last page

sanitation

Steam Generator

(*Continued from page* 117)

for example, the flour mix spilled on the concrete floor gets doughy. While hard to sweep up, it is easily and quickly removed by a blast of steam.

Walls are cleaned on a regular maintenance schedule that is now far easier to meet than when all cleaning had to be done by hand. The man-hours saved, while important in their reduction of cleaning costs, have enabled food manufacturer to do a better job.

Steam cleaning has been found to be especially effective on cinder-block walls. Although painted, such walls are still apt to collect dust and dirt in their pores. The steam washes all the dirt out of the pores, leaving a thoroughly clean wall. A detergent may be necessary if any grease or oil has been smeared steam alone is adequate.

(Speedylectric steam-jet cleaner is manufactured by Pantex Manufacturing Corporation, Dept. FP, P.O. Box 660, Pawtucket, R.I. Check 8365 opposite last page.)

Sanitizing powder sealed in packets

Uses: As a sanitizer for food processing equipment, pipelines, tanks, walls, and floors.

Features: Powder is non-toxic, non-corrosive, and non-irritating to skin.

Description: Sanitizer is a near-white powder which dissolves instantly in hard or soft water, forming a crystal-clear solution containing diatomic iodine, a powerful sanitizer. It is active at prevailing temperatures, summer or winter. It is described as equally effective against bacteria, viruses and fungi. It is supplied sealed in moisture-proof batch-size packets.

(Heliogen sanitizer is made by S. B. Penick & Co., Dept. FP, 50 Church St., New York 8, N. Y. . . . or check 8366 on form which is located opposite last page.)

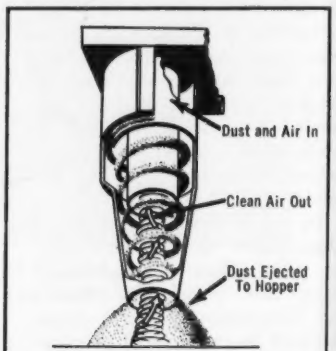
PROFIT IDEA FROM DUSTEX

A message to the Food Industry on how to increase profit by increasing the efficiency of product recovery methods.

● If you are presently discharging product to atmosphere from your spray drying operation you can turn this loss into profit by recovering product with a Dustex Microclone M-40-A Dust Collector.

The Microclone is a high-efficiency mechanical collector with proven performance in the food industry. It is a collector that has no moving parts, employs no filter media —a hinged cover provides ready accessibility for quick, easy cleaning. With Microclone you can step-up product recovery to the maximum...keep maintenance at the minimum.

For literature on the Microclone Collector and for details on how Dustex can furnish *proof-before-purchase* of the amount of product you can recover, write or phone, today!

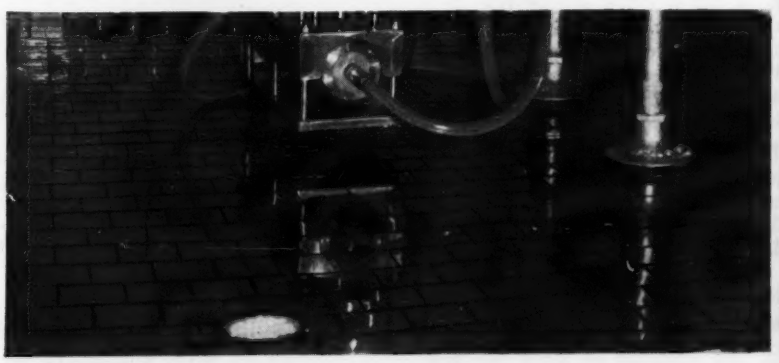


● This cutaway model of a single Microclone tube shows the operating principle of the minature cyclone.

Dustex CORP.

P. O. BOX 2520 • BUFFALO 25, N. Y.

When inquiring check 8367 opposite last page



"INDIVIDUALLY ENGINEERED" floors for food processing plants...

Atlas has developed a revolutionary new concept of permanent floor protection, "Individually Engineered" FURNANE FLOORS. This patented method of floor construction, based on sound engineering principles and the proper use of expansion joints, combines the tested techniques of installation with a brand new tile size 6" x 6" x 1⅜" pioneered by Atlas.

Designed to be sanitary, present an attractive appearance and wear indefinitely ... FURNANE FLOORS resist the effects of food acids, harsh cleaning agents and all other corrosives found in food processing plants.

For complete information write for your copy of "FOOD FLOOR FACTS" today.

ATLAS MINERAL
MERTZTOWN, PENNSYLVANIA

When inquiring check 8368 opposite last page

Magnetic ideas from ERIEZ

SAFE SAFE! No need to fear this safe will fall! . . . it's held firmly to the hoister by the tremendous magnetic strength of an Eriez Permanent Magnet. Combining herculean power and lifelong dependability, Eriez non-electric Magnets have found practical and valuable uses in industry, where Eriez HI-POWR magnetic separators are used to remove tramp iron from processing lines before it can start fires, damage machinery or cause product contamination. Eriez HI-POWR Automation Units are also used to control, convey and hold metals, from small parts to large steel sheets and pipe. They are easily installed on new or existing equipment, and offer many automated materials handling advantages. *All Eriez Magnets are non-electric, self-contained. They operate without any wires or attachments; magnetic power is guaranteed forever. The first cost is the only cost.*

GRATE MAGNET GRABS FAINTLY FERROUS SLAG. To help reduce rejects in dinnerware (caused by slag in the placing sand) the Buffalo Pottery Company of Buffalo, New York, installed a series of six Eriez Grate Magnets one above the other. The unit is directly below a gyratory riddle which is fed 10 tons of sand per hour. The unique design of the grate assures maximum spreading of the sand over the magnetic elements, without choking the flow of the purged material. The contaminated sand flows through the grates, onto the magnetic tubes and deposits ferrous particles on them. The top grate traps particles of stronger magnetic attraction, while the bottom magnet traps impure sands with so little imbedded iron that reaction to a test magnet is almost negligible. (In a recent quality-control test, an Eriez Grate Magnet removed 93% of a 100-200 mesh iron contamination in one pass through the magnet). Buffalo Pottery reports that since installation of the unit, rejects due to slag and impure sands have been virtually eliminated.

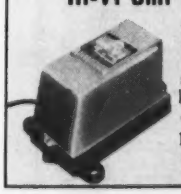
Eriez HI-VI electro-permanent magnetic vibratory equipment

Here's the first complete line of electro-permanent magnetic vibratory equipment that operates at 3600 CPM directly off an AC line. Just plug the units in—*no rectifier needed!* Eriez HI-VI units provide greater vibratory output with less power consumption. Less maintenance; lower installation costs. Lifetime-powered Alnico V magnetic element produces exclusive "double action" drive for greater productivity.

HI-VI Vibratory Feeders

convey, spread, agitate, cool, blend, mix, etc. Give an accurate, controlled feed to bulk materials.

HI-VI Unit (Bin) Vibrators



self-adjusting units keep bulk materials pouring evenly and smoothly through hoppers, bins, chutes, ducts, etc. Eliminate pile-ups, bridging, sticking, etc.

ROTA-GRATE GOES GREAT! Shown in use at the Columbus, Ohio plant of the American Zinc Oxide Company is a new Eriez development—the Rota-Grate. It's a revolving magnetic unit that provides fast, automatic removal of tramp iron from bulk materials which tend to clog or bridge when passed through small openings. Powerful magnetic tubes are rotated through material flows coming from above, combing and breaking the flows apart and trapping microscopic fines as well as larger pieces of iron. Rota-Grates may be installed at the discharge end of open or enclosed chutes, or may be enclosed within housings in open or closed duct systems. The unit is efficient for removal of ferrous contamination from fine cohesive materials such as cornstarch, lime, gypsum, or from fibrous materials such as alfalfa, flax, chopped hay, etc.

For more information on product at right, specify 8369 see information request blank opposite last page.

ERIEZ . . . pioneers and world's largest producer of Permanent Non-Electric Magnetic Equipment for industry have three major product lines to serve your needs.

HI-POWR MAGNETIC SEPARATORS (like those shown above) to remove unwanted iron from processing lines.

HI-POWR MAGNETIC AUTOMATION UNITS to handle untold materials handling problems . . . convey, transfer, control, elevate, re-position, etc., ferrous materials or parts during many manufacturing processes.

And

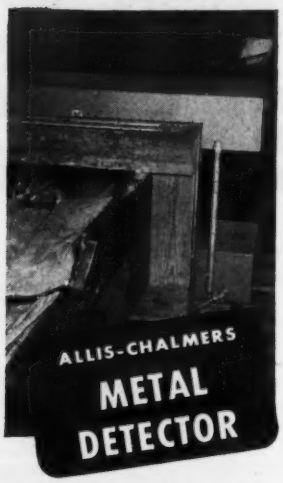
HI-VI VIBRATORY EQUIPMENT to move and accurately feed bulk materials. ERIEZ "Magnetic Ideas" can help you. Eriez' factory-trained field men, backed by Eriez extensive laboratory and engineering know-how, will be happy to study your particular problem, make a plant survey, and offer helpful "Magnetic Ideas."

WRITE FOR BIG NEW COMPREHENSIVE CATALOG OF ERIEZ ENTIRE LINE TODAY . . . state your particular problem and we'll try to assist. Eriez Manufacturing Company, 75 7 Magnet Drive, Erie, Pa.

ERIEZ HI-POWR MAGNETIC SEPARATORS

ERIEZ HI-VI VIBRATORY EQUIPMENT

Mr. Hi Frequency, the Electronic



"Sleuth"
Tracks Down
Tramp Metal

Gives
Positive Protection

THIS electronic Sherlock apprehends Mr. Tramp Metal before he can sabotage your quality product. Magnetic or non-magnetic particles, no matter how deeply embedded, cannot evade the piercing eye of the metal detector without triggering a warning or reject mechanism.

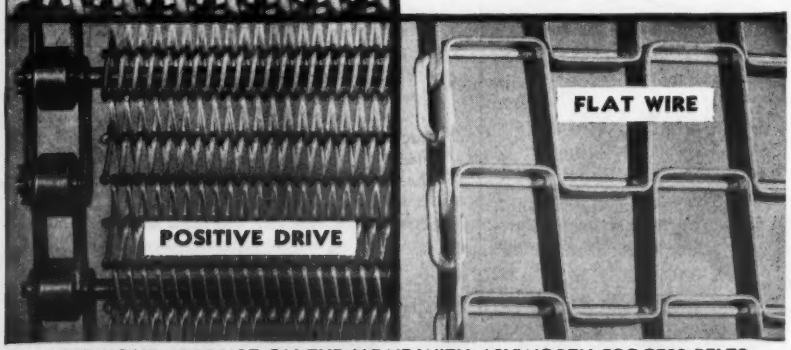
The Allis-Chalmers metal detector is economical to operate and is easily installed in any production set-up. For complete information, contact your nearby A-C office or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis. Ask for Bulletin 15B7217B.

ALLIS-CHALMERS
A-5285

When inquiring check 8370 opposite last page

Process Belts

No matter what your product or process is, there's an Ashworth Belt design and wire size to help you carry it more efficiently and more economically.



KEEP YOUR PRODUCT ON THE MOVE WITH ASHWORTH PROCESS BELTS

ASHWORTH BROS., INC.
WINCHESTER, VIRGINIA

WRITE FOR ILLUSTRATED CATALOG P55

Sales Engineers: Atlanta • Buffalo • Charlotte, N. C. • Chicago • Cleveland • Dallas • Detroit • Greenville, S. C. • Los Angeles • Louisville • New York • Philadelphia • Rochester • Seattle • St. Louis • St. Paul • Canadian Rep., PECKOVER'S LTD., Toronto • Montreal

When inquiring check 8371 opposite last page

Filtrate is poured into cell of fat testing instrument, and reading is taken

desk-top lab costs needs no trained

Here's "how-to-do-it", including equipment list and sampling, testing techniques

Features accurate "quick-tests", with results in time to make corrections in process

GEORGE A. SAVARD, Chief Chemist Luer Packing Co.
as reported by **KARL ROBE,** Associate Editor

Large meat packers maintain complete laboratories to guard their products . . . their basic financial equity. Many smaller packers need such service, but are hamstrung by budget difficulties. Luer Packing Co., of Los Angeles, is just such a company. Many are also confused through lack of knowledge as to what a minimum laboratory should involve in capital outlay, equipment, personnel, and finally, what results should be expected.

Here is a plan for a small "do-it-yourself" lab which

For moisture test: ground sample is spread thinly on filter paper, placed in moisture balance shown above, dried. Then moisture reading is taken directly from dial

under $1000 — operator

costs under $1000, fits in an area about desk-top size, and, with a little practice, can be operated by anyone on your present production staff.

Basic lab consists of two pieces of equipment: a fat tester, and a moisture balance instrument. Following is how each works.

Rapid Fat Tester

Sample is weighed on a simple trip balance; mixed with a solvent that comes with the kit, and blended in a Waring blender, or similar apparatus, for four or five minutes. Mixture is filtered. Clear liquid is poured into test cell of the instrument.

Reading is taken, and fat content is read from a con-

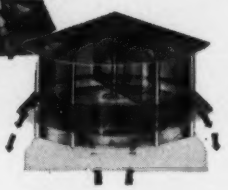
(*Turn to page* 125)

This homemade sampler is made from a two-inch stainless tube, slotted down front

SAFE
moisture and fume removal

Three outstanding features make Air-Van Power Exhausters especially suited for exhausting moisture and corrosive fumes.

Direct Drive
150 to 11,000 CFM.
S.P. to 4".



Belt Drive
3,000 to
65,000 CFM.
S.P. to 4".

- A patented scroll design assures positive air removal. Gallaher Air-Vans are designed to handle up to 65,000 CFM at static pressures to 4".
- The motor is out of the air stream.
- A patented air seal-off protects the motor by creating a constant curtain of fresh air around the motor shaft. This prevents any fumes from entering the motor housing.
- Other Air-Van features include quiet operation, low silhouette, weatherproof design, availability in special metals and finishes and certified ratings based on actual physical tests.

Patents 2188741 2526290
Patents pending

The GALLAHER Company

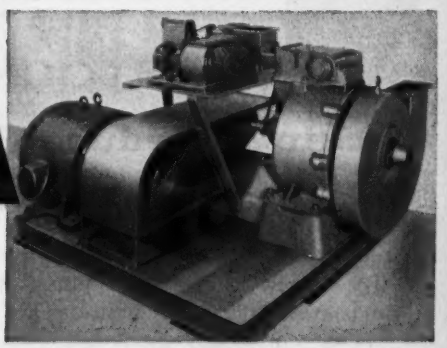
4108 Dodge Street Omaha, Nebraska
Export Office: 306 Paul Bldg., Utica 2, N.Y. Cable "Keiserquip"

When inquiring check 8372 opposite last page

Do You Need ULTRAFINE GRINDING?

FOR UNEXCELLED QUALITY WITH CONTROLLED PARTICLE RANGE

use a
SCHUTZ-O'NEILL PULVERIZER



Backed by 64 years experience!

If your product must be pulverized to ultrafine specifications and yet have controlled particle size distribution, you'll find proven Schutz-O'Neill "Superfine" Pulverizers best for the job.

Many products that are heat sensitive can be pulverized safely too, because the grinding principle of impact with air attrition keeps product temperatures down and helps control humidity.

Versatility of the Superfine Pulverizers makes them adaptable to the complete range of grinding from coarse to ultrafine. Schutz-O'Neill Superfine Pulverizers are used in the paint industry where ultrafine pigments with close particle size range are vital; by major cocoa powder, sugar, spice and pharmaceutical manufacturers; for emulsifier gums, resin, plastic and seaweed extract powders—wherever unexcelled quality grinding is required. Offered in 6 sizes ranging from 7½ to 125 HP with grinding chambers 12" to 28" in diameter.

FREE TEST GRIND OF YOUR PRODUCT
in our test lab! Tell us your milling requirement—fineness, uniformity, increased output, lower cost—send us a sample of the stock you want to pulverize, state fineness and capacity desired. You'll receive back your processed product plus our Engineering Test Report—there's no obligation.

Send for literature on Schutz-O'Neill Pulverizers

ESTABLISHED 1893 **SCHUTZ-O'NEILL COMPANY**

341 Portland Avenue • Minneapolis 15, Minnesota

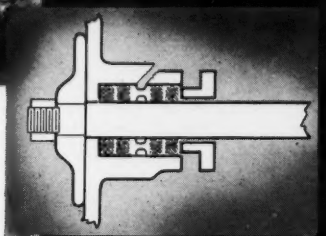
When inquiring check 8373 opposite last page

MORE OF
THE GARLOCK 2,000

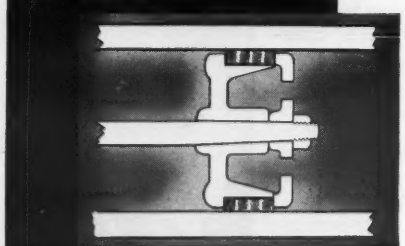
LATTICE-BRAID Packings of pure Teflon fiber for rotating shafts at high peripheral speeds . . . tough, chemically inert, yet resilient for positive sealing and cooler operation under extreme temperature and chemical exposure.

LATTICE-BRAID Asbestos Packing with Teflon impregnation, reduces friction, provides better seal with less gland pressure.

Wherever corrosion, contamination or torque is a problem on reciprocating applications or slow-turning valves CHEVRON† Packing made of Teflon is recommended.



Centrifugal pumps handling hot sulfuric acid and petroleum fractions leaked badly with ordinary packing. Also, new shaft sleeve required every few days. Teflon packing reduced leakage, and after several months service both packing and shaft were still in good condition.



Teflon packing rings on duplex pump handling 50% sodium hydroxide at 270 F. showed no sign of wear after 5 months. Formerly, packing lasted average of 30 days.

GARLOCK TEFLON*

Packings Reduce Process Shutdowns

Garlock LATTICE-BRAID† Packings of Teflon reduce maintenance, lower replacement costs, reduce wear on pistons and shafts, and increase productive capacity in countless pump applications where corrosive chemicals and severe operating conditions are encountered. The unique properties of Teflon (chemically inert, heat-resistant, low coefficient of friction, etc.) make it outstanding for use in chemical or petroleum process pump packings.

LATTICE-BRAID Packings of Teflon are another important part of "the Garlock 2,000" . . . two thousand different styles of packings, gaskets, and seals to meet all your needs. It's the only complete line. That's why you get *unbiased* recommendations from your Garlock representative. Call him, or write for LATTICE-BRAID Catalog AD 131.

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada. For information on other fluorocarbon plastic products contact United States Gasket Company, Plastics Division of Garlock.

*DuPont Company Trademark †Registered Trademarks

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints, Fluorocarbon Products

For more information on product at left, specify 8374 see information request blank opposite last page.

Desk-top Lab

(*Continued from page* 123)

version chart. Using reasonable care, an accuracy of approximately 1% can easily be attained. When experience has been gained in use of the instrument, a test can be made in 15 minutes or less.

Moisture Test Method

A small amount of sample is spread on a piece of filter paper, placed on the balance pan in the moisture balance. Hood, carrying an infra red lamp, is lowered into place over the thinly spread sample, and lamp turned on. Two dials on the instrument are brought into balance at start of the test, then brought back to balance at completion of drying time. Moisture content is read off the dials.

In the Luer laboratory, a drying time of 35 minutes, and Powerstat transformer setting of 85% of full load, has been found most satisfactory for sausage products. During this time, the operator spends only about five minutes doing the testing, and is free for the balance of the time for his (or her) other duties. Accuracy is on the order of 1%.

Methods are not official, but are accurate and rapid enough to furnish data in time to be of use in production department—as contrasted to over night drying and complicated operations using official methods.

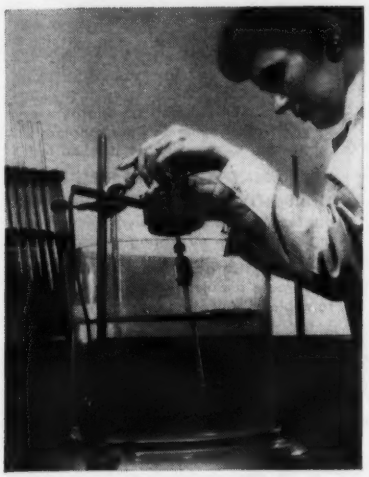
Protein analysis is not suggested because no quick methods are available. Since moisture, fat, and protein, constitute about 98% of meat products, an estimate of protein content can be readily made, for practical purposes.

Purchasing of meat supplies will be made on a sounder basis if lab checks are available to show fat-lean ratio. Fat and moisture balance during the making of the emulsions, and in the finished product, can be used to sharpen production techniques and evaluate the best production methods for consistent results.

Other advantages include: compliance with government

(*Turn to next page*)

FISHER
has a mixer for every laboratory job!



Fisher Scientific, America's largest manufacturer-distributor of laboratory appliances, can supply you with the most comprehensive assortment of stirrers, mixers and shakers, including combination units which both heat and agitate. And you can get these, along with more than 15,000 other items of laboratory equipment and over 7,300 chemicals, direct from stocks maintained in the seven Fisher plants serving the United States and Canada.

STIRRERS

Stirrers with adjustable speeds, changeable blades, electric or air driven, portable or permanent mounting . . . you'll find them all at Fisher Scientific. (Illustrated: Fisher Heavy-Duty Stirrer)

MIXERS

Motor-driven Fisher Mixers, with or without automatic timing, combine vibrating, tumbling and stirring agitation. For use with all types of liquids and solids. (Illustrated: Fisher Kendall Mixer)

SHAKERS

For mixing, dissolving and blending solutions, dispersions, emulsions and other liquids. (Illustrated: Fisher Gyrosolver)

B-41a

Write for handy bulletin It's a 16-page guide to the selection and uses of Fisher Stirrers, Mixers and Shakers.

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When inquiring check 8375 opposite last page

VISCOSITY*

*"That property of a body in virtue of which, when flow occurs inside it, forces arise in such a direction as to oppose the flow." — *Webster*

BROOKFIELD*

*Pioneer and world leader in the development and manufacture of precision viscosity instruments. Today, Brookfield is universally accepted as the World's *Standard for Viscosity Measurement and Control!*

AND YOU*

*A scientist interested in easy, accurate viscosity measurement or control for laboratory or production processes. You'll be happy to learn, too, that more than 300 technical articles and references based on Brookfield and viscosity measurement of 200 different materials have been published in the past ten years. You are welcome to any of this data which may pertain to viscosity measurement control problems you have.

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Brookfield know how is yours for the asking without obligation

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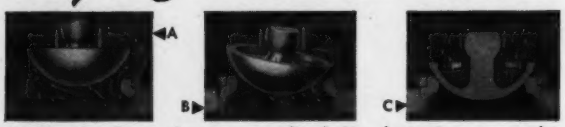
When inquiring check 8376 opposite last page

THIS
"VALVE WITH A THOUSAND SEATS"
. . . increases
PUMP EFFICIENCY
and PUMP CAPACITY

● Here's a revolutionary idea in pump valves that results in much longer, trouble-free valve life and greater pump capacity. The ROYAL CROWN PUMP VALVE has only three separate parts. Valve is guided by a frictionless ball stem (not a rigid guide) which allows it to oscillate and turn with the fluid stream. It swings freely with each stroke of the pump — seating perfectly each time in a new position. There is a minimum of resistance to the fluid, which results in greater pump volume at less pump speed. Royal Crown PUMP VALVES handle all types of liquids . . . are adaptable to all reciprocating pumps.

Royal Crown PUMP VALVES



(A) Round valve surface is streamlined. No obstructions to restrict the flow. (B) Ball-guided valve rotates and swings with each stroke of the pump. Each turn, each swing . . . a lapping action, a continuing perfect seat. (C) Free vertical action assures instant opening and closing. Ball stem is a frictionless guide.

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BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
Write for details today
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PAINT RIGHT OVER CONDENSATION on Walls, Tanks, Equipment

GARLAND'S DAMPWALL SUPERNAMEL really adheres to moist walls, machinery and equipment—penetrates *through* the moisture film to bond solidly with any surface, masonry, metal or wood. You can paint right over condensation on walls, coolers, vats, tanks or machinery.

Deodorized, too—no need for shut-downs because of paint odors. Dries overnight.

DAMPWALL SUPERNAMEL won't yellow off, contains a special additive that stops mildew or mould. Made in white and colors.

Send us your special paint problem.

Your Garland Man is a trained specialist in solving paint, roof and floor maintenance problems. He's a good man to consult.

Write Dept. FP-6 for Folder A-451

MADE BY GARLAND the Sign of Quality

THE GARLAND COMPANY
Cleveland 5, Ohio

When inquiring check 8378 opposite last page

quality control

Desk-top Lab

(*Continued from page* 125)

regulations; insurance against extra-legal or off-quality batches; and more accurate method for selling ground meats on a prescribed fat content basis.

Workable System Involves Precautions

The quality control system suggested above has been simplified to bare essentials through application of experience and technology. It can be operated by non-technical personnel. When first setting up the lab, however, benefits will be obtained quicker if samples are run in duplicate whenever a test is run in the plant, and a duplicate sent to a commercial laboratory. After a few such checks, the plant personnel develop confidence in their results . . . then they can start making use of their information.

Once the proper procedures are estabilised, (size of sample to use, best instrument settings, time intervals, etc.) then only occasional checking by outside technologists need be done.

Sampling Techniques are Important

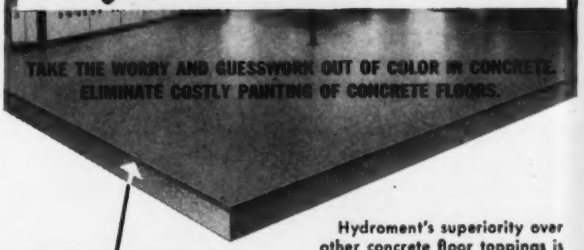
The sample used for testing must be representative of the whole lot — or else the lab tests are meaningless. At Luer, sampling is done by a simple, homemade sampling tube as pictured at bottom of page 123. It is a piece of 2" stainless steel tube 24" long. A strip about an inch and a half wide has been cut out down the entire length of the tube, leaving it open at the front.

The slot in front is important. Without it, friction of the meat in the tube would block passage, and prevent its rising more than a few inches. No such trouble is experienced when the slot is provided.

The two or three cores are taken to the lab, and mixed by hand. The meat is then flattened into a king-size hamburger and quartered.

(*Turn to next page*)

For the BEST in NEW CONCRETE FLOORS,
Architects, Contractors and Cement Finishers
Prefer HYDROMENT



Hydroment's superiority over other concrete floor toppings is a well established fact.

Here's a Surface with IMPROVED Hardness, Density Wearability, Corrosive, Resistance, and Lasting Appearance.

HYDROMENT IS BEST BECAUSE:

1. Proper balance of quartz and iron aggregate results in an unexcelled wearing course with no rusting or dusting.
2. Optimum grading of quartz and iron aggregate imparts surface density unobtainable in any other concrete hardener.
3. No periodic maintenance problem with Hydroment. It resists rugged wear for unusually long periods.

Write for Complete Details and NEW HYDROMENT BULLETINS.

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THE UPCO COMPANY
PIONEERS IN INDUSTRIAL RESEARCH SINCE 1881

When inquiring check 8379 opposite last page

20 CANS A MINUTE... *opened, drained and rinsed!*

The new Langsenkamp "101" Can Opener is completely automatic . . . does the work of four men. Depending on the product's consistency, it can open, drain and rinse up to 20 No. 10's a minute. Positively eliminates the chance of can slivers getting into your product.

Ideal for canners, frozen food processors, bakers, or any users of liquid or semi-paste product . . . for any product that will drain through a 4" opening. Provides cleaner, more efficient handling—no loss due to spilling or splashing of product. Equipped with stainless steel underpan 60" x 20" x 15" wide, ¼ hp motor, 806 lbs. net weight, pump optional.

The "101" Automatic Can Opener is one of a complete line of Langsenkamp machines for food processors which also includes manually-operated can openers and automatic can crushers. Write for full details.

F. H. LANGSENKAMP CO.
227 E. SOUTH ST. • INDIANAPOLIS 4, INDIANA

When inquiring check 8380 opposite last page

Desk-top Lab

(*Continued from page* 127)

Two opposing quarters are then taken and mixed. Quartering may be repeated if necessary, to reduce volume but still maintain original proportional makeup. Final sample is then ground two or three times through a ⅛" plate, and placed in a jar with a tight-fitting lid to prevent moisture loss. This then, is the working sample which is used in the tests described above.

(Infrared moisture tester is available from Central Scientific Co., Dept. FP, 1700 W. Irving Park Rd., Chicago, Ill. . . . or for more information check 8381 opposite last page.)

(Steinlite fat tester is available from Seedburo Equipment Co., Dept. FP, 618 W. Jackson Blvd., Chicago 6, Ill. . . . or for more information check 8382 opp. last page.)

Lab detergent removes scum, film, streaks

Strips organic and finely divided deposits from laboratory vessels

Features: Due to action of water softener, all water-hardness minerals are locked up and prevented from depositing as bacteria-harboring film or scum. Detergent is useful as preliminary step in sterilization and in exacting titrations and analyses.

Description: Included in formulation, is sodium hexametaphosphate, for water softening. "Frozen" glass joints, stopcocks, and stoppers, are loosened in soak solution of detergent. Many stubborn organic deposits, proteins, fats, oils, media, dried blood, wax pencil marks, finely divided deposits, are stripped from laboratory vessels by detergent.

(Sparkleen laboratory detergent is available from Fisher Scientific Co., Dept. FP, 346 Fisher Bldg., Pittsburgh 19, Pa. Check 8383 on form opposite last page.)

where the need is Critical

THERE are some fields of industry, some professions, where more than ordinary care is required. Food is one, medicine another, chemical research a third. Here purity in its truest sense must be enveloped with meticulous care every step of the way.

Relatively minor elements of equipment often play a vital part. For example, if the tubing used to transport liquid food should be attacked by one of the food chemicals trouble could be serious; a life could be endangered if the wrong tubing were used to convey blood or blood plasma; a research project could fail if contaminants leached out to spoil a solution.

This is why those whose job it is to safeguard purity specify Tygon Tubing for critical tasks. This flexible, plastic tubing, crystal clear, flexible as a piece of string, tough as leather, resistant to acids and alkalies, offers a combination of properties found in no other material.

And like metal alloys, basic properties of this unique "flexible glass" plastic tubing can be varied to meet a wide range of special requirements. Thus, Tygon Tubing is made in many standard formulations and in innumerable special ones.

That is why those whose job it is to safeguard purity specify the specific formulation of Tygon Tubing designed to fit their exact needs . . . *for they know, as do we, that no single formulation can do all things well.*

Tygon plastic Tubing is made in many formulations, each designed for a specific usage . . . and in over 60 sizes, from ⅛" to 3" I.D. Write for Bulletin T-97.

PLASTICS & SYNTHETICS DIVISION

U. S. STONEWARE

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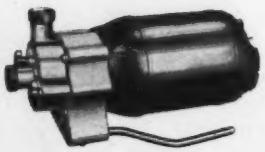
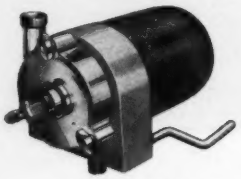
When inquiring check 8384 opposite last page

G AND H

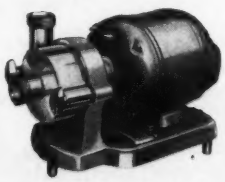
THE STANDARD OF QUALITY IN *Centrifugal Pumps*



Model FH-136



Model F-140



Model 136

Performance-tested "G&H" Centrifugal Pumps are designed to meet the exacting requirements of the dairy and food processing industry. Every pump is individually tested and proved at the factory for volume, head, and vacuum. There is a model for every need.

PORTABLE CLEAN-UP PUMPING UNIT

—saves hours of maintenance time — move it right up to the job. 3-Caster Dolly, properly balanced for easy handling. 60-cycle 3450 RPM motor is totally enclosed. ½, 1, 2, 3, 5, 7 or 10 H.P.

Write for illustrated Bulletin and prices

G AND H PRODUCTS CORPORATION

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When inquiring check 8385 opposite last page

new literature

Reviews of books and industrial bulletins describing equipment, supplies, services

Canning methods theory told in sterilization text

Text authored by C. Olin Ball and F.C.W. Olson explains theory of destruction of organic cells by heat, development of mathematical methods for predicting this destruction, and present practices employed by the canning industry.

Discussion includes resistance to heat of various organisms, and mechanisms of heat transfer in food and food containers. Additional section shows how general methods can also be adapted to predicting destruction of vitamins and flavors.

"Sterilization in Food Technology", 654 pages, can be obtained by remitting $16 direct to McGraw-Hill Book Co., 327 W. 41st St., New York 36, N. Y.

Explains how to select and apply adhesives

Four basic factors which determine adhesive selection for application on various surfaces using equipment of variable speed and stroke are presented in an illustrated bulletin.

Other sections explain the 30 principal manual, semi-automatic, and automatic methods for applying liquid adhesives in production work, 8 ways of metering adhesives, how to handle adhesives in high-speed production machinery, and compression factors that affect bond strength.

Bulletin No. 27 — "How to Select and Apply Adhesives" is available from Paisley Products, Inc., a Morningstar, Nicol, Inc., subsidiary, Dept. FP, 630 W. 51st St., New York 19, N.Y. When inquiring specify 8387 on form which is located opposite last page.

Adjusting ramps have generous lip travel

Six-page illustrated bulletin explains operating features of automatic adjusting ramps. Drawings show how ample lip travel prvides for movement of 15″ above and 15″ below floor level. Box and channel design are used in construction for high ratio of strength to weight.

Power may be electric or air-oil. By using I-beams, ramps may be installed outside of existing loading docks or flush against buildings where no loading docks exist. Platform is 6′ wide x 8′, 4″ long. Capacity 20,000 lb roll over and cross-over loads.

Bulletin on Trans-O-Matic ramps is issued by Globe Hoist Co., Dept. FP, E. Mermaid Lane at Queen St., Philadelphia 18, Pa. When inquiring specify 8386 on form opposite last page.

Describes sugar bait fly killer

Applications of a fly-killing material, trade-named "Dipterex", are described in 6-page leaflet. Active chemical ingredient, discovered in Germany, is 0,0-dimethyl-1-hydroxy-2,2,2-trichloroethylphosphonate (Bayer L 13/59).

Flies attracted to bait feed on it and die within a few minutes. Material is odorless, may be used dry or liquid. To prepare a water solution, mix 4 oz in 1 gal water, add 2 cups of corn syrup or 1 lb of dry sugar and stir until dissolved.

"Kills Flies" (D2-256) is available from Chemagro Corp., Dept. FP, 437 Fifth Ave., New York 16, N.Y. When inquiring specify 8388 on the convenient Reader Service slip opposite last page.

Other reviews of catalogs, bulletins, books, data sheets, etc. are found throughout the magazine. Many advertisements also mention availability of this type of literature. For a complete alphabetical directory to ALL this new industrial literature, turn to Part I of the "quick-locator" directory on page 133.

Proceedings of meeting on antibiotics in agriculture

Proceedings of First International Conference on Use of Antibiotics in Agriculture is now available. Book contains 16 papers covering growth response in animals, mode of action, crop usage, food preservation, and public health aspects. General objective of conference was to take inventory of what is known and surmised regarding antibiotics outside of human therapy.

"Antibiotics in Agriculture", 278 pages, can be obtained by remitting $2.50 direct to National Academy of Sciences, National Research Council, 2101 Constitution Ave., Washington 25, D.C.

Dehydrofreezing, freeze drying included in third edition of freezing text

Volume I of third edition of Tressler & Evers "Freezing Preservation of Foods" includes new chapters on dehydrofreezing, freeze drying, freezing of game, warehousing, marketing, retail cabinets, transportation, and sanitation.

Previous editions have been in one volume, but advances have been so extensive as to necessitate putting third edition in two volumes. First volume, now available, covers freezing of fresh foods—second volume will cover prepared foods.

"Freezing Preservation of Foods", Volume I, 1240 pages, can be obtained by remitting $18 direct to Avi Publishing Co., 31 Union Square, New York 3, N. Y.

"Employe Interest in Company Success"

What is the nature and extent of employe interest in company success? How and under what circumstances can it be stimulated and strengthened? An approach to answering these and similar questions that is practical and positive, characterizes a recently published book on the subject. This work is intended to add to the relatively few available texts which deal with the common goals of industrial relationship. It is based on interviews with employes, union officers, supervisors and executives in eight manufacturing companies.

Value of the study lies in qualitative results, not statistical presentation. Investigators sought each interviewee's spontaneous opinions.

Questions and answers serve to direct attention to considerations not fully appreciated. Text describes employment terms and prospects which justify employe interest; personal characteristics and performance related to "interest"; supervisor-employe relationship; what information employes want and dissemination of it.

"Employe Interest in Company Success" by John W. Diegel, Prof. of Industrial Relations, University of Michigan. 302 pp — 46 tables, 5 charts, clothbound, $6.00. Order from Publications Distribution Service, University of Michigan, Ann Arbor, Mich.

Truck driver manual now in new edition

A driving manual used in many fleet driving courses has been revised and re-issued. Contents is a compilation of authoritative data based on performance of successful drivers and teaching methods of qualified instructors. Text covers preparation for trip, right way to start truck and take-off, correct road practice, parking, and truck care.

Driver manual can be obtained by remitting $1.25 to The White Motor Co., 842 E. 79th St., Cleveland, Ohio.

. . . they last longer! Wham! wham! wham! all day long, day in and out . . . your products, parts or produce are slammed onto conveyor lines. The conveyor belt that lasts the longest is NOT the hard, rigid, plied up belts of supposedly TOUGH materials, but WOVEN COTTON. Buffalo belts are solidly woven with the STRONGEST cotton yarn ever produced. These woven cotton belts have a natural built in "bounce" that ABSORBS impact. That's why we call them "CUSHIONIZED" conveyor belts. Nothing you normally convey can DENT, DIG or DESTROY this belt except OLD AGE itself! Beat a cotton cushion with a hammer as long as you like. Then you'll know what we mean.

In addition, the PLIABLITY of these belts is important. Hard, rigid belts *resist* every imperfection on the line and grind over and against bumps and angles. That's not so with Buffalo woven-cotton Belts. They smoothly mould AROUND or OVER obstacles and keep going.

NEXT TIME . . . get the "belt with the bounce". It will cost a LOT LESS and LAST A LOT LONGER.

200 SIZES
35 WIDTHS
7 THICKNESSES

6 SPECIAL SURFACES

In addition to Buffalo's regular woven belt, which is ideal for most conveying jobs, we also COAT this basic belt SIX DIFFERENT WAYS to meet SPECIAL REQUIREMENTS. Whether you need a belt to resist weather or water; acids, oils, grease or alkalies; highest or lowest temperatures or to handle dainty pure foods or just plain rough and tough material . . . we have a belt, specially surfaced to handle the job.

WRITE for 14 page manual on "How to Buy The Correct Belt for Your Conveying Job". Illustrates regular and treated Belts and their USES.

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208 CHANDLER STREET BUFFALO 7, NEW YORK

NEW YORK PHILADELPHIA CHICAGO DETROIT LOS ANGELES

We also manufacture a complete line of WEBBINGS and PURE SHEET RUBBER.

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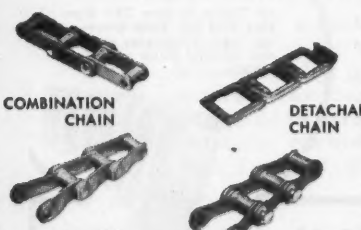
for Elevator, Conveyor and Power Transmission Chain

For the chain best suited to your exact needs, see your nearest Moline *Chain Store*. He stocks all types and sizes of chain for conveying, elevating or power transmission. He offers a wide selection of attachments and can furnish chain in either malleable or longer wearing Promal. There are no delays—you get immediate delivery.

Call your nearest Moline *Chain Store* for information, prices or consultation.



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new literature

Catalog lists brushes used by food plants

Brushes for dairy and food processing plants are described in an 8-page illustrated catalog. Selection of brushes offered is based on findings of recently conducted survey. Brushes for machine and hand milk bottle cleaning and for use in labs are just a few of those listed.

"Brushes" is issued by The Creamery Package Mfg. Co., Dept. FP, 1243 W. Washington Blvd. When inquirjng specify 8391 on the convenient Reader Service slip which is located opposite last page.

Describes applications of 34 process controls

More than 34 basic types of industrial temperature and pressure controls are described in a 96-page catalog. Self-operating regulators, water mixing equipment, indicating and recording instruments, are included in wide selection offered. Applications also cover heating, ventilating, air conditioning, and hot water supply.

Control catalog is issued by Powers Regulator Co., Dept. FP, 3434 Oakton Blvd., Skokie, Ill. When inquiring specify 8392 on form which is located opposite last page.

Comprehensive dictionary of microbiology

Chemists, bacteriologists, mycologists, many others will find comprehensive, 276-page dictionary of microbiology useful. Explicit definitions of thousands of terms are included—organisms, tests, culture media, chemical compounds, biological processes, and many others.

"Dictionary of Microbiology", can be obtained by remitting $6.75 direct to D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N.J.

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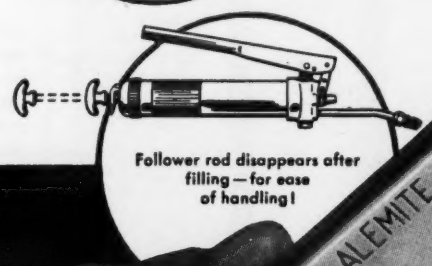

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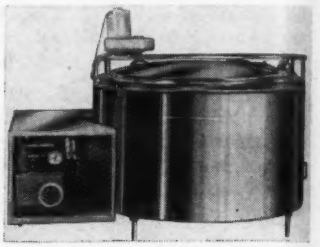
Round tank for cooling milk, described in 4-page bulletin, can be provided with steam-jacketed sides for use as a cooking unit. Cooling



Cooker-cooler is available with refrigeration unit attached

coils are in the base of the tank. Can be hooked into plant's refrigeration system, or attached to condenser outside room or area where tank is placed.

"Easy-to-clean Round Tank" Bul RW2 is available from Groen Mfg. Co., Dept. FP, 4535 Armitage Ave., Chicago 39, Ill. When inquiring specify 8395 on form which is located opposite last page.

Canned Foods

(*Continued from page* 31)

The short-high temperature sterilization of foods by steam or electrical heating (dielectric, inductive or resistance) can result, bringing all foods to a kitchen-cooked quality, and by refrigerator warehouse storage this quality can be retained for long periods of time. Since some canners are already enjoying a premium price or increased sales on their products which are high-short processed, there is no doubt but that expansion will take place in that direction. This will be encouraged by moderately priced agitating cookers and by increasing demand for higher quality by the canned food consumers.

*The author is indebted to Dr. C. O. Ball and his article, "The U. S. Canning Industry from 1940 to 1950", *Food Manufacture*, 27, 180, 1952, for assistance in describing these methods of food processing.

Discussed in this issue . . .

I. new industrial literature

II. processes, equipment, ingredients, and supplies

Use this two-part "quick-locator" when you want information or new industrial literature on a specific type of process, equipment, ingredient, or supply mentioned in the articles or advertisements in this magazine. For your convenience, this directory is divided into two sections: the first covers articles and advertisements which specifically mention availability of bulletins, data sheets, etc.; the second, articles and advertisements which describe processes, equipment, ingredients, and supplies.

If you want copies of these bulletins or more information on other listings you can write direct to the manufacturer . . . or turn to inside back cover and use the convenient information request reply envelope. This "Reader Service slip" is provided by the publisher . . . no obligation or charge, of course, to you. The publisher contacts the supplier concerned for you — information comes to you direct.

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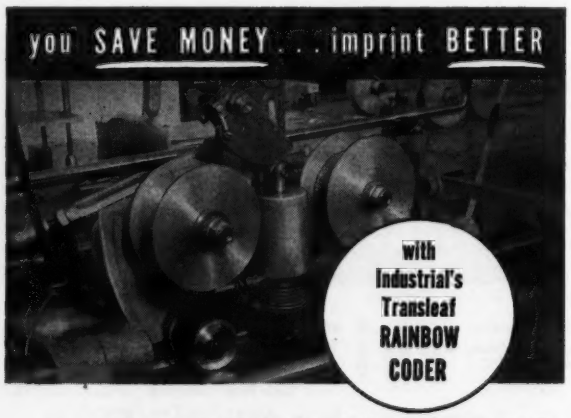

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JUNE 1957

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√	Key	Description
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☐	8175a	Pure or Imitation Vanilla
☐	8175b	Tru-fruit Flavors
☐	8175c	Concentrated Fruit Juices
☐	8176	Air Separator
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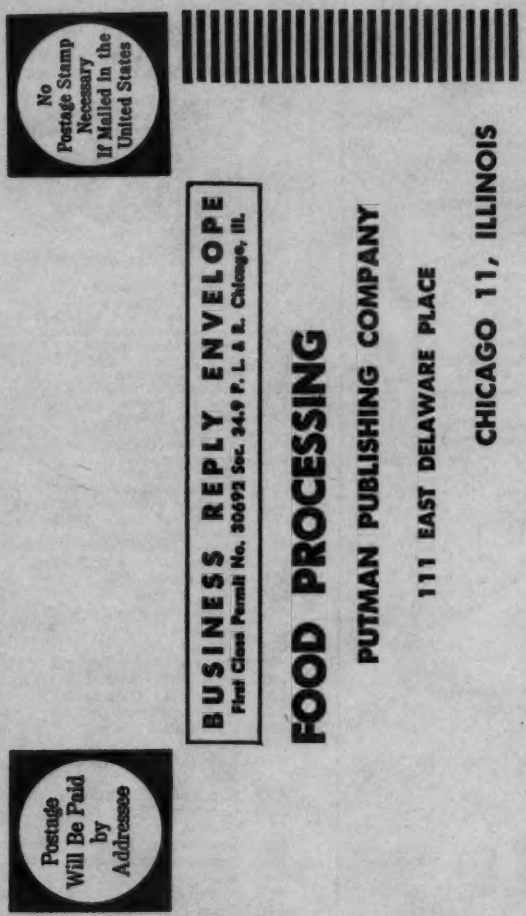
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JUNE 1957

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That's Interesting

Pizza pie wagon

Demand for pizza pies made them widely avail It's not too surprising th fore that they're now from a mobile vendor. An Coppotelli, Staten Island dor of Italian foods oper the handsome pizza pie wa pictured here. Truck is a wheelbase International all-steel Metro Van b Stainless ovens in rear duce 75 16" pies per hou

Horse feed

What is the typical die a horse? Well, "it ain't h Arabian horses subsist some extent on dates, some sheep or camels n Swaps, the famous thorou bred likes eggs. In Denm 2.2 lb of a mixture of molasses and dried swa peat replaces an equal amo of corn. Cocoanut meat been used for U S A horses to replace oats. U farm horses have been kn to eat as much as 20 lb of sugar beet pulp daily.

Other items suggested equine diet are cooked p toes and straw, carrots rutabaga tips.

Don't peek at answers, see questions, page 2

1) $71.8 billion. 2) Only wartime. 3) $1,400 per av age American family, $427 capita. 4) $274 billion.

almost every packaged poultry product . . .

has more glittering display value . . .

greater heat-and-serve consumer convenience . . .

when it's in a proven-by-sales package by . . .

The Plus Container

EKCO-ALCOA CONTAINERS *Inc.*
Wheeling, Illinois

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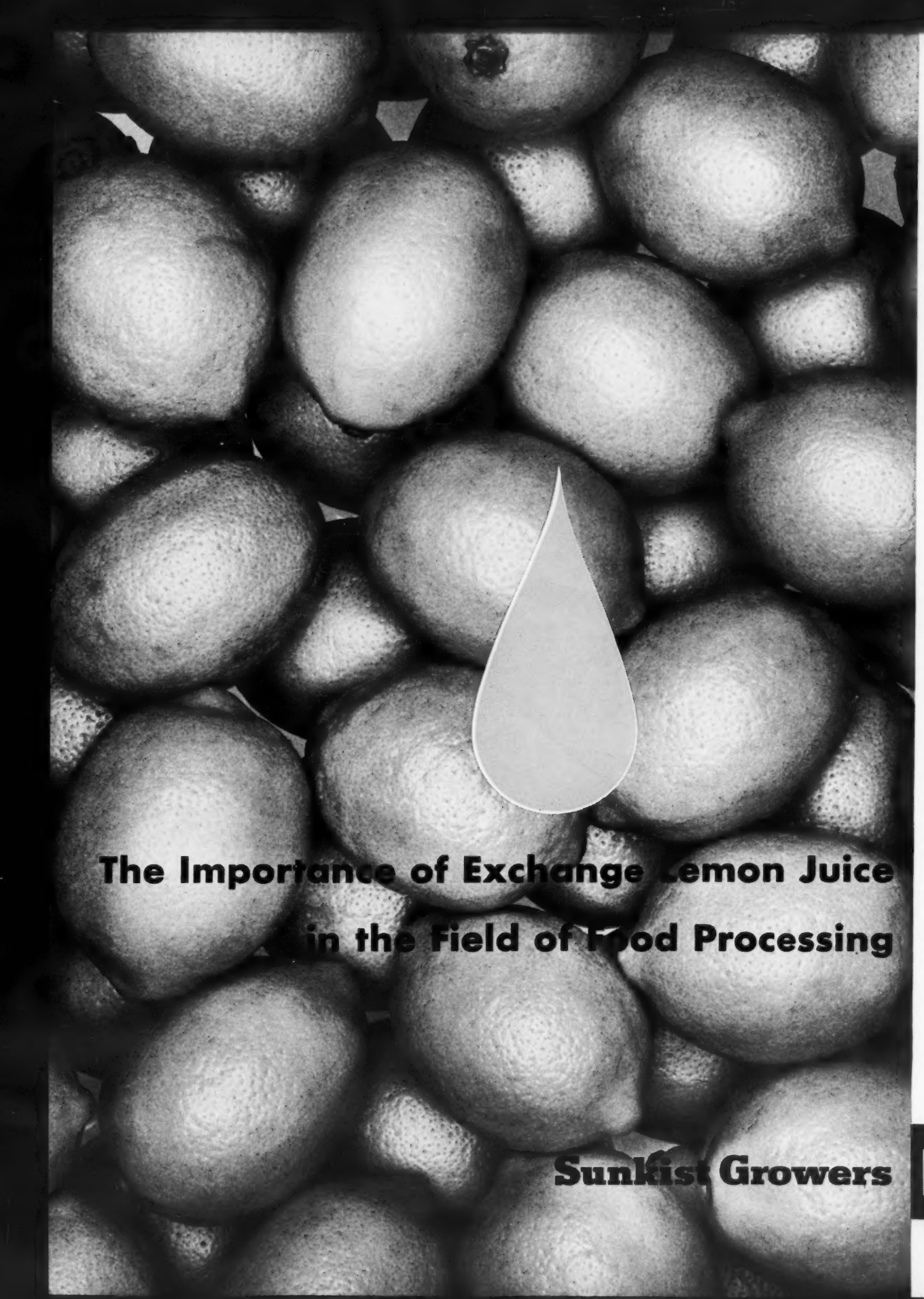

The Importance of Exchange Lemon Juice in the Field of Food Processing

Sunkist Growers

Concentrated lemon juice plays a matchless role in production of quality food products, as these established uses indicate...

In baby foods to adjust acidity and improve quality.

In canned figs to increase acidity, reduce autoclave temperature and to improve flavor and texture.

In prune juice to improve flavor and palatability.

In fruit nectars to improve flavor and palatability.

In low acid fruits to improve flavor and texture and shorten processing time.

In canned vegetables (artichokes, mushroom, etc.) to adjust acidity.

In mayonnaise and salad dressings to improve flavor and storage life and permit taste acidity adjustments to any deserved level.

In cocktail sauces to improve flavor.

In vegetable juice cocktails to improve flavor.

In low sodium diet products to use as a salt replacement.

In frozen fruits to prevent browning.

In pared or diced fruits and vegetables to prevent browning.

In fruits and vegetables to prevent browning during the interval preceding heat processing.

In frozen sea foods (especially those high in oil) to preserve freshness.

In breaded shrimp to improve flavor and preserve freshness.

In canned sea foods to improve flavor (and in some cases the color).

In fruit pie fillings as an acidulant.

In pure preserves and jellies as an acidulant.

In jellied salads and aspics as an acidulant.

In fruit drinks and fruit-flavored beverages as an acidulant.

In ascorbic acid-treated foods to potentiate and to increase the ascorbic acid's effectiveness.

Exchange Concentrated Lemon Juice is an asset to your product...a distinction to its label. Let us prove this with an actual product test.

Exchange

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